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IN RELATION TO SOME CLINICAL PROBLEMS IN NEUROLOGY.*

BY C. P. SYMONDS, M.D. OXF., F.R.C.P. LOND.,

PHYSICIAN FOR NERVOUS DISEASES, GUY'S HOSPITAL; ASSISTANT PHYSICIAN, NATIONAL HOSPITAL, QUEEN-SQUARE.

I PROPOSE to discuss the nature and distribution of the pains that may result from injuries to the nerve-fibres of the sensory pathway, selecting for this purpose a few examples from lesions at different levels.

Pathological Lesions.

PERIPHERAL NERVES.

In the condition known as causalgia, which may sometimes follow injury to one of the peripheral nerves, the unfortunate patient suffers from an almost continuous burning pain in the peripheral distribution of the injured nerve. Associated with the spontaneous pain there is an extreme degree of tenderness to stimulation in the peripheral distribution of the nerve so that even a light contact or a sudden change of temperature may result in what is described by the sufferer as an agonising pain. This sensation has further two characteristics—a certain explosive vividness and a tendency to be referred diffusely to the whole distribution of the nerve instead of to the spot stimulated.

When the skin of the affected area is examined for sensibility in the ordinary way, it will be found that there is a relative defect of sensibility to the ordinary forms of stimulation so that, for instance, a degree of touch which, on the sound hand, is regularly appreciated as such, is not felt in the median supplied area of the injured hand.[1] There are other changes to be observed, such as dryness or sweating of the skin and sluggishness of the capillary circulation. But the point I wish to emphasise is the association of three phenomena—spontaneous pain, a raised threshold for all forms of cutaneous sensibility, and painful over-reaction to such stimuli as are able to cross the threshold.

POSTERIOR ROOT.

Working our way up the sensory pathway, we may next consider analogous phenomena quite commonly observed in cases of tabes, where the lesion is of the posterior roots or more probably at the point of entry of the posterior root-fibres into the spinal cord. It is not unusual in cases of tabes to encounter the complaint of spontaneous pain of segmental distribution, for instance, on the chest or abdomen, associated with extreme hyperalgesia—that is to say, the patient will suffer the keenest pain whenever the skin of the affected area is stimulated. It is to be noted, by the way, that the most effective stimulus is of the kind which may be presumed to stimulate a large number of nerve-endings simultaneously or in rapid succession, such as stroking contact with the hand or a pin dragged across the skin. Extremes of temperature may produce the same effect, and the sufferer learns from experience to be very careful about letting himself down into a cold or hot bath and to avoid turning movements of the body such as may cause stroking contact with the underclothes. Again, if we examine the area concerned, we shall find there is a relative insensibility to cotton-wool, pinprick, and temperature as compared with normal parts—the phenomenon of raised threshold and over-reaction.

SPINAL CORD.

A similar state of affairs may be observed, though not at all commonly, it is true, in lesions of the spinal cord. Holmes,[2] in his Goulstonian lectures on traumatic lesions of the spinal cord, has published instances from his experience, and every neurologist will have met with examples. As might perhaps be expected, they are to be found chiefly in diseases affecting the central areas of the spinal cord, such as hæmatomyelia and syringomyelia. I have seen several cases of the latter condition, in which intolerable pain and hyperalgesia have been the leading symptoms, again associated with relative anæsthesia to temperature and pinprick. In cases of spinal cord tumour and disseminated sclerosis I have met with the same phenomenon. The following is a characteristic example :—

Mrs. A., aged 34, was referred to me in 1926 with the story that six weeks previously, while seated at dinner, she had suddenly experienced a sensation of painful numbness in her right arm and leg. During the subsequent week this sensation increased in intensity on the right side and later extended to the left lower limb and left side of the trunk up to the breast and the two ulnar fingers of her left hand. She had noticed also some slight weakness of her legs and a little hesitancy in micturition.

At the time of examination she stated that the extent of the numbness had diminished. Her chief complaint was of spontaneous excruciating pains involving the right hand, right side of the trunk, and right lower limb. These sensations she described as if her finger-nails and toe-nails were being torn off and her bones were being crushed in machinery. She complained also of great soreness over the right side of the body and right thigh.

On examination she showed a ptosis, enophthalmos, and miosis on the right side—the signs of a cervical sympathetic paralysis; there was a slight degree of nystagmus on deviation of the eyes to the right. The intrinsic muscles of the right hand were weak and perhaps wasted as compared with the left. Along the inner border of the right arm and over the right side of the trunk cotton-wool touch, pinprick, and stroking contact gave rise to intense pain. Over the same area temperatures which on the other side of the body were described as warm or cool were referred to as burning or icy cold. There was no loss of sensibility to cotton-wool, but over the area of hyperalgesia sensation to pinprick was markedly dulled—that is, a stronger stimulus was required to produce a sensation than on the left side, but when sensation came it was explosive and exaggerated. Over the lower abdomen and thigh on the right side heat and cold were imperfectly distinguished. On the left side of the body there was no definite upper level of sensory defect but sensibility to pinprick was diminished over the whole of the lower limb and the lower part of the trunk. There was no loss of postural sense on either side. The tendon-jerks in the upper limbs were normal; the abdominal reflexes in the left side were difficult to obtain, there was relative weakness of flexion at the left hip. The knee- and ankle-jerks were present and equal, and both plantar responses were absent. There was no clinical or radiographic evidence of vertebral disease. The Wassermann reaction was negative in blood and spinal fluid. The fluid contained nine lymphocytes per c.mm., showed a slight increase of protein (0·04 per cent.) and of globulin, and an abnormal colloidal gold curve 0 1 1 2 1 1 0 0 0 0.

In the course of the subsequent four years the pains and hyperalgesia gradually diminished in extent and severity but she continued to have occasional clawing pains in her right hand with a permanent sensation of numbness and pain on stroking contact.

She had a single generalised epileptic fit three months after I first saw her. Two and a half years later she had an attack of girdle pain around her trunk at the fifth thoracic level with numbness in her right lower limb. On examination she showed in addition to the relics of her original

* Part of a lecture to the Leeds University Medical Society.

lesion defective postural sense in the toes of both feet, diminution of all the abdominal reflexes, and an occasional extensor plantar response on both sides.

The diagnosis of disseminated sclerosis in this case is rendered probable by the clinical facts together with the findings in the cerebro-spinal fluid. In a disease in which multiple lesions are the rule, it is not possible to determine with certainty the site of any one of them, but the bilateral distribution of the sensory disturbance with an upper level on both sides corresponding to that of the eighth cervical segment, together with the cervical sympathetic involvement, point to a focus in the cervical enlargement of the spinal cord as the cause of the right-sided pain and hyperalgesia for which she originally came to me.

BRAIN-STEM.

Still following the sensory pathway upward, we find that in certain lesions of the brain-stem we may meet with similar phenomena. For instance, occlusion of the posterior inferior cerebellar artery by thrombosis results in a particularly discrete clinical syndrome, enabling us to localise the lesion with accuracy. One of the constituent symptoms of this syndrome is a loss of sensibility to pain, temperature, and, to a certain degree, to cotton-wool, on the opposite side of the body, due to a lesion of the spinothalamic tract. In one or two instances of this syndrome, within my own experience, and in several that have been published by others, the patient has shown the phenomenon of raised threshold and over-reaction.

THALAMUS.

It is, however, when we get nearer the optic thalamus itself that we find this syndrome most constantly and in its most marked degree, so that a so-called "thalamic syndrome" is recognised, in which the most constant symptom is that of spontaneous pain of hemiplegic distribution with relative loss of cutaneous sensibility, but extreme painful over-reaction to any stimulus that is strong enough to excite. The patient in this condition will describe his pains and painful reactions to stimulation in the most vivid language and, perhaps the most striking feature of the phenomenon which I am describing, from lesions at whatever level, is the explosive vivid quality of the painful sensation.

Human Experiment.

Before discussing the significance of these clinical facts, I shall pass to the consideration of another group of material—that obtained from experimental injury in man.

This began with the classical researches of Head and Rivers.[3] Head had the radial nerve cut in his own forearm and, together with Rivers, made careful observations upon the subsequent disturbance of sensation. Briefly, they described a central zone of anæsthesia to all forms of stimuli and, surrounding this, a very narrow marginal or intermediate zone in which finer stimuli, such as cotton-wool touch and degrees of temperature not far removed from the skin, were not appreciated at all, but painful stimuli, such as pinprick and extremes of heat and cold, were appreciated more vividly than on the normal skin. In the course of recovery, they observed that the central (originally anæsthetic) zone passed through a stage comparable with that observed at first in the intermediate zone. That is, there was a stage in which sensibility to the finer stimuli remained absent whilst coarser stimuli were now perceived. Furthermore, these coarser stimuli produced an explosive painful over-reaction recognised as an altogether new quality of sensation. They were led to the conclusion that there existed two separate systems of nerve-fibres and nerve-endings—that the one group, which they called epicritic, was concerned with the registration of cotton-wool touch and finer grades of temperature; and that the other, the protopathic group, was concerned with the registration of coarser stimuli of a painful character.

Head and Rivers believed that the epicritic fibres in a peripheral nerve had a wider distribution with less overlap than the protopathic. Hence, as the result of nerve section, a central zone, in which both epicritic and protopathic sensibility were lost, and a narrow zone outside this, in which epicritic sensation only was lost, leaving protopathic sensibility unmasked. They further concluded that in the process of regeneration protopathic sensibility returned first, so that in the recovering central area there was a phase during which protopathic sensibility could be observed before it was covered up and masked by epicritic. This theory implied under normal conditions an antagonism between protopathic and epicritic impulses, in which the epicritic held the mastery and inhibited the protopathic. In areas in which epicritic sensibility was absent and protopathic remained, its uninhibited activity led to the explosive over-reaction to suitable stimuli. Trotter and Davies,[4] who repeated the experiment of human nerve section upon themselves and upon a larger scale, confirmed in the main the observations of Head and Rivers, but arrived at different conclusions. They found that in the intermediate or marginal zone there was a gradually increasing defect from the outer edge inwards of all forms of sensibility, and considered it to be due to overlapping of the cutaneous supply from the cut nerve by that of others. They observed that the hyperalgesia in this marginal zone developed only 10 or 12 days after the nerve section, and concluded therefore that it could not be explained as a direct result of the nerve section as Head and Rivers's theory required. They noted that this hyperalgesia of the marginal zone passed off in the course of six or seven weeks—that is, before phenomena of regeneration were observed. They suggested that this marginal hyperalgesia was due to products of degeneration from the dead terminal nerve-fibres causing irritation of the surrounding intact nerve-endings.

The phenomenon of intense over-reaction observed in the central area during the phase of recovery they ascribed to a pathological state in the recovering nerve-fibres. Trotter [5] has developed this hypothesis further, suggesting that the over-reaction is due to the fact that at a certain stage of recovery the terminal axis cylinders having not yet found their end-organs, are in naked contact with the surrounding connective tissue. Their nakedness is comparable to the normal state of pain nerve-endings, and it is for this reason that only the coarser stimuli will excite and that the only possible sensation is that of pain. According to this hypothesis the peculiarly intense and explosive quality of the over-reaction might be due to the fact that the insulation of the axis cylinders from the surrounding connective tissue is in the regenerating nerve much less complete than in the case of the normal pain nerve-ending.

In brief, Trotter and Davies found themselves unable to agree with the epicritic-protopathic theory of Head and Rivers, and considered the phenomenon of raised threshold with over-reaction "consistent with the view that it depends on some condition of

the recovering nerve or nerve-ending which is only very slowly restored to the normal."

THALAMIC SYNDROME.

Head's attention was later attracted to the thalamic syndrome to which I have already referred, and he sought here again to explain the facts on the assumption that there are two centres in consciousness for sensation, on the one hand the thalamus itself, which is concerned with what one may call affective sensibility—painful or pleasurable—and on the other hand the cerebral cortex concerned with finer qualities of sensation. He supposed that the thalamus was normally inhibited by a cortico-thalamic strand of fibres and that the thalamic syndrome was a release phenomenon due to a lesion of this inhibitory tract. The general idea underlying this hypothesis is, it will be seen, the same as that which formed the basis of the epicritic-protopathic theory of the peripheral mechanism of sensation.

In criticism of Head's thalamic hypothesis it may be pointed out that it does not explain the constant occurrence—as admitted by himself and Holmes in their joint paper [6]—in all cases showing the so-called thalamic pain and painful over-reaction, of some degree of sensory *loss* on the affected side of the body. Nor does it explain the occurrence of similar phenomena as the result of lesions in the brain-stem and spinal cord.

Trotter's hypothesis, on the other hand, seems to provide a satisfactory explanation for the clinical facts which I have already set out. We have noted that the phenomenon of raised threshold and over-reaction with or without spontaneous pain may be observed from lesions of the sensory pathway at any level—peripheral nerve, posterior root, and spino-thalamic tract in cord and brain-stem up to the level of the thalamus itself.

Judging from clinical observation the essential condition for the production of this syndrome at whatever level is a certain degree of incompleteness of the lesion. The necessary degree of incompleteness may develop ab initio, or it may be attained only at a certain stage of recovery. If recovery then continues and the lesion becomes less complete, the necessary conditions for the syndrome are lost and it disappears—as in the regeneration of a peripheral nerve, and in many lesions of the spinothalamic tracts. Or again, in the case of a progressive lesion, the syndrome may appear, and later disappear as the lesion becomes more complete; for instance, in the advancing degeneration of the posterior root-fibres in tabes. Occasionally, however, the lesion may become stable at the essential degree of incompleteness and the syndrome persists indefinitely.

These are the main facts as they appear to me from clinical observation, and are consistent with the hypothesis originally suggested by Trotter and Davies that the phenomena of raised threshold and over-reaction observed in the skin supplied by a regenerating nerve are due to a certain pathological state in the nerve-fibres themselves.

ACTION CURRENT AFTER NERVE SECTION.

We may find some further support for this hypothesis among the data provided by experimental work on animals. It has been known for many years that stimulation of a motor nerve causing a contraction of the muscle it supplies is associated with the passage of an electric current down the nerve which can be recorded by suitable instruments, and is known as the action current. Within recent years it has been possible by means of valve amplifiers to demonstrate and record similar action currents passing up the afferent nerve-fibres as the result of peripheral stimulation.

Most of this work has been done at Cambridge by Adrian and his collaborators,[7] and they have shown that the action currents in afferent nerves behave on the whole in very much the same way as those observed in the efferent fibres. The response to peripheral stimuli is of an all or nothing type and takes the form, not of a continuous current, but of a sequence of impulses of extremely brief duration separated by almost equally brief interruptions due to the refractory state of the nerve which immediately follows the passage of a current. Using various stimuli—touch, heat and cold, pressure, joint movement, and pinprick—such as would presumably in the conscious animal give rise to corresponding sensations of specific quality, Adrian has found that the action current is in all cases very much the same, lending support to the supposition long entertained that there is no specific quality in the nervous impulse as conducted from the various sense organs, and that the specific qualities of conscious sensation depend upon some transmutation at the central (cerebral) end of the sensory pathway. The only difference observed between the action currents resulting from weak or strong stimuli is that in the case of the latter the frequency of the impulses is higher and the duration longer. This suggests that the only means available at the central end of the pathway for measuring the intensity of a stimulus is the number of impulses arriving at the same point in a given time.

In the case of painful stimuli—that is, stimuli which would presumably cause pain in the intact animal—the action current is of relatively long duration. Adrian therefore suggests that "the main feature of the discharge which causes pain is that it must possess a certain massiveness." Adrian [8] has further investigated the action currents which develop in the central end of an afferent nerve after section or injury. He has shown that under such circumstances a persistent discharge develops with a frequency comparable to that obtained from stimulation of the peripheral sense organs and may continue for as long as two hours.

To quote from his conclusions:

> "It has been found that the activity is due to repeated excitation from the cut ends of nerve-fibres of a particular type, and that it can be abolished or greatly reduced by treating the ends with novocain, or by removing the thick nerve sheath and any blood-vessels and connective tissue adhering to the nerve."
>
> "Until more data have been collected it would be unwise to say how far these discharges are responsible for the pain which is felt after injury to the tissues. The fibres in which they occur are distributed to structures which give rise to pain and are not usually credited with giving rise to any other sensation, and the stimuli which produce them—freeing the nerve from surrounding tissues, cutting, &c.—cause reflex movements in the spinal animal and would be likely to cause pain in man."

Conclusion.

These conclusions have an obvious bearing upon the problems which we have been discussing, and especially upon the hypothesis that the pain and painful over-reaction resulting from a partial lesion of the sensory fibres may be due to loss of insulation and consequent contact of naked axis-cylinders with surrounding connective tissue. It would not be profitable to follow the implications of this work of Adrian's too far. Its direct bearing is upon the phenomenon of spontaneous pain. But it seems at least possible that in the case of a partial lesion (as opposed to complete section) the nerve-fibres might

be left in a condition in which they would only react to a strong stimulus and would then react excessively.

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THE ABDUCTION TREATMENT
AS A PRACTICABLE ROUTINE FOR ALL TYPES OF FRACTURE AT THE HIP-JOINT.

BY ROYAL WHITMAN, M.D., F.A.C.S.,
OF NEW YORK.

THE long campaign to extricate fracture of the neck of the femur from the therapeutic slough of despond has verified the proposition that "only by varied iteration can alien conceptions be forced upon reluctant minds." On this occasion, I shall vary the iteration by suggesting that the established or standard practice is the expression of what may be figuratively termed an inferiority complex, since it is an adaptation to the mechanical inadequacy of conventional appliances to meet the requirements of normal repair. For, manifestly, since the neck of the femur projects laterally from the shaft, splinting and traction can at best appose the fragments only in a lateral and, therefore, unstable relation.

This inadequacy was clearly demonstrated by Sir Astley Cooper early in the last century, and the rules of conventional practice are based on his conclusions—namely, that the result is practically determined by the situation and character of the injury, and that positive intervention is essentially hazardous and futile. Hazardous, because the typical patient is aged and infirm, and because a possible impaction might be "broken up" which might otherwise assure union. Futile, because the typical complete fracture is incapable of repair. Therefore, "the ideal object of treatment, restoration of form and function, is rarely to be attempted or even sought. The first indication is to save life, the second to get union, the third to correct or diminish displacements" (Stimson).[1]

Treatment in accord with these indications, in which the fracture, as such, is the last consideration, has been symptomatic in intention and perfunctory in application.

Bissell,[2] from an investigation in three of the leading hospitals in New York, concluded that as a treatment for fracture it was absolutely futile, and recent statistics indicate that this conclusion has a general application at the present time. In 1928, Katzenstein,[3] of Berlin, reported on 169 cases of transcervical fracture treated by conventional methods. Good results were attained in 11·6 per cent., a percentage which, according to Axhausen, who discussed the paper, represented fairly the general experience. In a recent report of 136 medial fractures treated at the Charity Hospital in Berlin, reported by Hübner,[4] bony union was attained in 6 per cent. and passable function in 17 per cent.

The abduction method, utilising anatomical instead of artificial mechanics, is adequate both to correct deformity and to appose displaced fragments securely; to assure, in other words, the essentials of functional repair in a comprehensive sense. Its technical efficiency can hardly be questioned, at least from a comparative standpoint, since it may be demonstrated on the cadaver, at open operation and by X ray pictures. Its application to the living subject, however, simply because it was in accord with the treatment of all other fractures, seemed from the conventional or static standpoint, a hazardous experiment both on life and limb, for which the adventurous surgeon who disregarded all established precepts might be called to account. Gradually, however, by a process of infiltration and disintegration, the obstacles to progress have been overcome, and what was originally a logical inference has been amply confirmed by practical experience—namely, that, because of the greater physical, mechanical, and nutritive obstacles to success that this fracture presents, the result is more directly determined by the efficiency of the treatment than is that of any other injury of its class.

In 1927 Löfberg [5] reported on 176 cases of medial fracture treated by the abduction method. Bony union and good function were attained in 67·5 per cent. Reggio [6] has recently reported on 49 cases of medial fracture of a most unfavourable type treated at the Massachusetts General Hospital; 40 per cent. of the patients were over 70, yet union was attained in 66 per cent. of the cases in which it was carried to a conclusion. This presents a striking contrast to an investigation of final results by Scudder at the same hospital in pre-abduction days, in which it is stated that in but two of the 16 cases examined was the limb functionally useful. Henderson,[7] of the Mayo Clinic, in a series of 42 cases, reports bony union in 90 per cent. of the patients under 60, and in 65 per cent. of those above that age. He concludes that, classing all deaths as failures, a proportion of 77 per cent. and 54 per cent. respectively may be considered as fairly representing the prognosis.

At a recent symposium on the treatment of medial fractures, Anschütz,[8] of Kiel, expressed the opinion "that any other treatment than by the abduction method was irrational and absurd." Mosenthal,[9] of Berlin, said that there could be no discussion of the relative merits of a treatment that had, according to published statistics, raised the percentage of bony union to 75 per cent., and in his own practice to 90 per cent. of the cases. He concluded that the real obstacle to its general adoption was inability to meet its requirements.

Restoration of Function.

Thus far, only the transcervical fracture has been considered, because its alleged incapacity for repair is the actual basis of the conventional routine in a comprehensive sense, since it is generally assumed to be the "true" or characteristic type, particularly in old age. In 341 cases investigated by Stebbing,[10] however, 230, or 77 per cent., were extracapsular, although the average age of the patients, who were inmates of a poor-law infirmary, was 69 years.

Yet in this type of fracture, although union is assured, the correction of deformity, other than to the extent that may be automatically effected by traction, is rarely attempted.* In fact, function, other than capacity for locomotion, has received no consideration, either in the primary treatment or after-care or even in the analysis of the final—and what has been assumed to be the inevitable—disability. For, to quote a British authority, "In

* "Local treatment is limited to making only so much reduction of the shortening as can be expected by moderate traction, and to immobilisation by traction, or by cushions or by a fixed dressing."—Keen and White's American Text-book of Surgery, Philadelphia, 4th ed., 1903, p. 368.

all cases function is for ever impaired; no matter whether the fracture has taken place within or external to the capsule, whether it has united by ligament or bone, shortening of the limb and lameness are the inevitable results."[11]

Now that a method is at command adequate to assure the essentials of functional repair, fracture at the hip may be considered from the therapeutic standpoint as an entity. If, therefore, the two types of fracture are fairly equal in number, a satisfactory result may be predicted in 85 per cent. of the cases in which efficient treatment has been carried to a conclusion, as compared with 22 per cent. in the cases† investigated by the British committee.[12]

The last support of the tripod on which the negative standard is based is the danger of positive treatment.‡ This has now been disproved by comparative statistics—viz., Campbell,[13] 205 elderly patients with a mortality of less than 5 per cent.; Waldenström,[14] 103 cases, 50 being over 70, 10 per cent.; Löfberg,[15] 264 cases, 6 per cent.; 77 cases at the Hospital for Ruptured and Crippled, 6 per cent.; 42 cases at the Mayo Clinic,[16] 14·2 per cent. The highest death-rate is that reported by Reggio,[6] 49 cases, 26·5 per cent. Even this figure compares favourably with the statistics most available for comparison, reported from the Presbyterian Hospital of Philadelphia[17]: 58 cases with 16 deaths, 27·3 per cent., and is far below that of Smith[11]: 60 cases, 38 deaths, 63 per cent.

The practical effect of a teaching which has offered no incentive to efficiency has been to standardise neglect. Of 120 consecutive cases of ununited fracture at the hip, recorded at the Mayo Clinic (Henderson[18]), "not one had been efficiently treated at the time of the injury," although but 5 per cent. of the patients were over 70 years of age. Of 170 consecutive cases recorded at the Hospital for Ruptured and Crippled, only 52 were received within a week of the injury; the others, with a few exceptions, represented inefficient treatment or neglect—the distinction, as far as indicated by results, being somewhat problematical.

The abduction treatment, since it is opposed to what is called the consensus of opinion, has in the past received little consideration in the text-books. Now, however, it is coming into general use, and this seems an opportune time, in view of the various modifications of the treatment that have been introduced, either by inadvertence or intention, to present again what may be termed the orthodox version in the sense that it has not been materially changed since its introduction.

The Medial Fracture.

In the application of what may be termed the anatomical method to the complete medial fracture, the head fragment, contained in the acetabulum, is considered as a fixed point, to which the movable fragment must be adjusted. This outer fragment projects upward from the shaft, and it can be brought into line with its fellow in the same horizontal plane only by abducting the shaft to the degree that corresponds with the angle of the femoral neck (Figs. 1–3). Thus, the shortening and outward rotation having been corrected, the limb is abducted, and as the limit of the normal range is approached, tension on the capsule, which encloses each fragment, must align them and force a resistant contact. In this attitude of complete abduction and extension, stability is assured by mutual pressure of the fractured surfaces; by the inclusion of the fracture line of the subcapital fracture within the acetabulum; indirectly by the contact of the base of the neck and the trochanter with its projecting border; finally, by the complete suppression of muscular contraction as an agent of displacement. Furthermore, the attitude of full abduction and extension, by tension on the anterior part of the capsule and the overlying iliopsoas muscle, must prevent the interposition of tissue between the fragments if the limb is rotated inward to the required degree.

FIGS. 1 2 3.

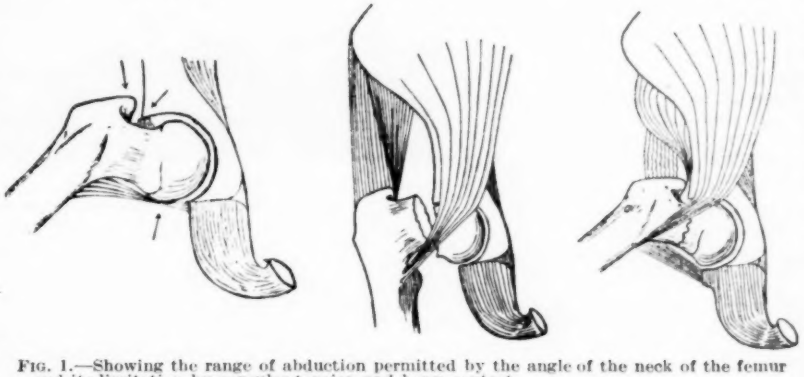


FIG. 1.—Showing the range of abduction permitted by the angle of the neck of the femur and its limitation by capsular tension and bony contact.
FIG. 2.—Showing the typical upward displacement and outward rotation of the shaft fragment and the deforming influence of muscular contraction which, according to Sir Astley Cooper, cannot be controlled by external appliances.
FIG. 3.—Showing the security assured by ligamentous tension, bony contact, and suppressed muscular action in the attitude of full abduction.

Repair of the medial fracture is an interstitial process, unaided by external callus, and depends therefore on secure and prolonged apposition of the fragments. In the treatment of fractures at the base, repair is practically assured, and the correction of deformity to restore normal function is the first consideration. In fractures of this type, the neck in relation to the shaft is displaced downward and backward, and to this position the limb-fragment which is under control must be adjusted, by reducing the shortening and apposing the fractured surfaces by inward rotation and abduction. This manipulation does not differ essentially from that already described; deformity, even if resistant, is easily corrected by natural leverage on the fulcrum of the acetabular rim. The traditional impaction, to disturb which was once a "surgical crime," is no longer of any special significance. Indeed, it would appear that the

† In these cases the results as analysed by Sir Robert Jones were as follows: in 20 cases between the ages of 26 and 45 there were but six good functional results; in 30 cases between 45 and 50, eight; in 36 cases over 60, five, or 22 per cent.: and in but 16·4 per cent. were there both good anatomical and functional results.

‡ "If I had a mother who were to have a fracture of the neck of the thigh-bone I would say, 'Just make her as comfortable as you can and let her go without any further consideration.'" —L. A. Connor, quoted in a discussion on ununited fracture at the hip, Jour. of Med., 1927, viii., 235.

ancient conception of an impaction, as an implantation of one fragment in another which assures stability and repair, was based on a doubtful interpretation of the physical signs. At the present time what often passes as an impaction in the X ray pictures is in most instances a complete fracture in which the apparent shortening of the neck is explained by outward rotation of the shaft fragment, which actually separates the fractured surfaces. One rarely has an opportunity "to break up an impaction," because no resistance is offered. One restores symmetry in this as in other fractures as an essential preliminary to normal repair. If there were no deformity there would be no necessity for correction, but only for support in that degree of abduction that would best assure functional recovery.

The essentials of functional repair having been attained by utilising anatomical mechanics, it only remains to support the limb in an attitude that assures the internal splinting. Thus it will appear that the treatment of this fracture has become as simple and definite as that of any other fracture.

Application of the Abduction Method.

The details of its application to the patient are, in substance, as follows: the limb, having been powdered, a fitted covering of stockinette, extending from the neck to the toes, is applied to protect the skin from wrinkles. The patient is then placed on a Hawley table and anæsthetised, since complete muscular relaxation is essential to ligamentous tension. The two apposed and extended limbs are supported by assistants, and the shortening is reduced by direct manual traction aided by pressure on the trochanter, the limb meanwhile being rotated slightly, as indicated by the position of the patella (Fig. 4). The two limbs, under manual traction, are then abducted by the assistants, the sound side indicating the normal range to which the other must correspond.

FIG. 4.

The first step in the abduction treatment. The shortening is reduced by direct manua traction and verified by measurement, the limb having been rotated slightly inward as indicated by the position of the patella (comparative).

At this stage the operator must assure himself that the two limbs are equally abducted on a level pelvis, and that the anatomical landmarks on the two sides correspond absolutely (Fig. 5).

The trunk and limb are bound with sheet wadding, many layers being applied about the chest and pelvis, and the bony prominences of the limb being carefully protected. A final covering of Canton flannel bandage assures an even elastic surface for the plaster splint. A long spica, extending from the axillary line to the extremities of the toes, is then constructed. This is strengthened by reverses at the points of

FIG. 5.

The second step. The limbs under manual traction are abducted to the normal limit as indicated by the range of the sound side, upon a level pelvis, the surgeon verifying the exact correspondence of the landmarks on the two sides.

strain and, for greater security, a steel bar bent to the proper angle is inserted in the trochanteric region. The long spica, when properly applied (Fig. 6), supports the limb in full abduction, to assure adjustment by ligamentous tension; in full extension, to maintain the normal lumbar lordosis; in slight inward rotation, to turn the fractured margin away from the capsule; in flexion at the knee, to lessen the strain, the foot being held in the neutral attitude. The patient usually remains for a time on the table, the drying-out of the plaster being hastened by electric heaters. Meanwhile, the support is carefully trimmed about the margins and cut away sufficiently to permit full flexion of the thigh on the uninjured side.

The patient is then placed on the bed, the head of which has been raised for a foot or more, with cross-boards beneath the mattress to prevent sagging. The inclination is very important. It enables the patient to look about the room and to dispense with pillows. It increases the blood-supply of the injured part and, as compared with the reverse position usually employed with traction, it should lessen the tendency to congestion of the thoracic organs and aid the digestive processes.

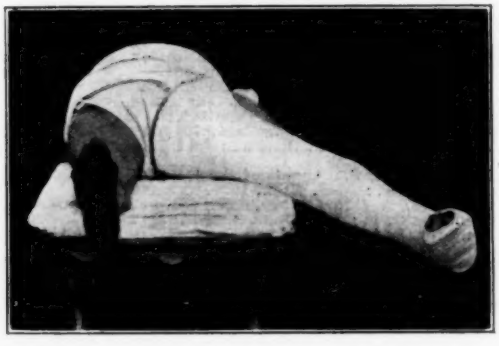
When the plaster splint is firm, the patient is turned completely over (Fig. 7). The hand is then inserted

between the plaster and the sacrum, and sufficient space is assured to prevent any possible pressure. At a later time a second covering of shirting is drawn over the plaster and sewed to the underlying one, so that all the margins may be soft and smooth.

The plaster spica, the most salient indication of the positive as contrasted with the negative standard, and the most direct test of technical preparedness, has borne the brunt of criticism both on theoretical and practical grounds. Since, however, constraint of both trunk and limb is essential to the control of the fracture, no appliance can compare in comfort and efficiency with the plaster spica when properly applied. The position of the patient may be changed at will, and from time to time he is turned completely over. Thus hypostatic congestion and bed-sores have become only of historical interest, and the range of practicability of treatment as regards age and infirmity has been greatly increased. For it has now been demonstrated by comparative statistics that efficient treatment of the fracture is the most conservative treatment of the patient. There is the further advantage that the treatment is entirely under the control of the one who conducts it. An X ray picture taken after the operation should demonstrate the apposition of the fragments and, since the maintenance of this primary essential of repair is not dependent upon the coöperation of the assistants, the patient may be transported to his home or elsewhere. Thus these patients may now receive efficient treatment at hospitals without encumbering the wards.§

The duration of the treatment will vary with the character of the fracture. If it is transcervical it may be assumed that complete fixation for a period of three months will be required to assure stability

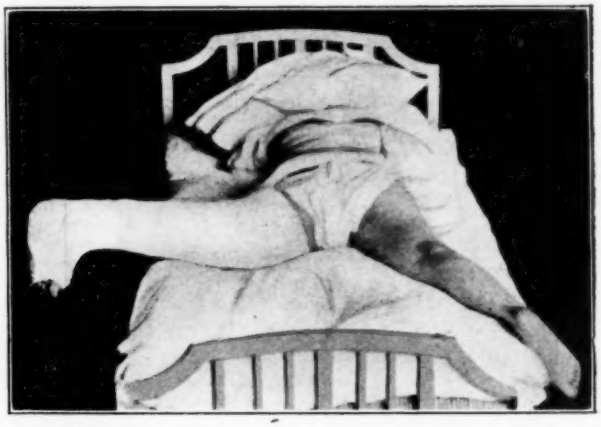
FIG. 6.



The plaster spica immediately after application to an obese patient.

of repair. If at the base, the time may be lessened materially. At the termination of the fixation period, the upper half of the plaster splint is removed and in a day or two the splint is dispensed with altogether. The patient then remains in bed for approximately another month for massage and for functional exercises of the limb. Several times a day the limb is abducted by the attendant to the normal limit, and this is continued until voluntary control is regained, otherwise the range of abduction will become progressively restricted. During this period, restriction of movement at the knee should be in great part overcome by passive manipulation and voluntary exercise.

FIG. 7.



The inclination of the bed and the prone posture as preventives of bed-sores and hypostatic congestion, showing the outer covering which binds the margins of the plaster.

Repair of the transcervical fracture is slow and unstable, while in those at the base the process is similar to that in other situations but, since the neck of the femur is subjected to much greater strain than are other bones, weight-bearing should not be permitted until X ray pictures and the physical signs indicate stability of repair (Fig. 8). This period for the transcervical fracture may be estimated at six months and, if early locomotion is desirable, a protective support, such as the Thomas calliper brace, should be provided. Thus it will appear that from the functional standpoint the after-care is of almost equal importance to the immediate correction of the primary displacement.

Criticisms and Alternative Methods.

A new treatment must be undertaken by novices, and the influence of custom and tradition and previous training is reflected in the various modifications that have been suggested. For example, to the uninitiated, a treatment which requires the administration of an anæsthetic and the construction of a plaster splint is evidently regarded as an ordeal both for the surgeon and the patient, for which a period of preparation is indicated, or the attempt is made to reduce the displacement by preliminary traction before applying the spica. There is a very general impression that the bed, and particularly the extended attitude, is dangerous for elderly subjects, reminiscent doubtless of the old conditions in which bed-sores and hypostatic congestion were common complications of treatment. For this reason the spica is sometimes applied in flexion at the hip and knee to permit the sitting posture, and one surgeon incorporates a kitchen chair in the plaster splint to permit self-propulsion as well. Others fear compression of the chest, and use the pelvic type of spica, which requires fixation of both limbs to assure security. Finally there are those who attempt to apply positive treatment by means of the old appliances of which

§ According to Sir Robert Jones, at the present time these patients are usually sent to poor-law infirmaries, and in a recent period of five years but 14 cases were treated in the wards of St. Thomas' Hospital (W. R. Bristow).

traction is the basis, on the ground apparently that if, by greater labour and pains, one can accomplish in some instances the desired result by indirect and uncertain methods, it is to the advantage of the patient and to the credit of the surgeon.

FIG. 8.

A transcervical fracture, showing bony repair.

One may summarise the objections to these alternatives in a few words. Immediate and definite correction of deformity is more essential to success in this than in any other fracture. The flexed attitude increases the difficulty of adjusting the fragments and applying the spica, with no compensating advantage. The short spica requires restraint, and consequently muscular atrophy of the uninjured limb. Traction in this situation is at best a mechanical makeshift, which has been discredited by past experience, and which has the further disadvantage of subjecting the patient to the discomfort and danger of persistent dorsal recumbency.

There still remains for consideration the open operation which, in the treatment of other fractures, is indicated only when the fragments may not be apposed otherwise. As applied in this instance, it dates from a time when there was no effective means of fixing the fragments and which, to quote from a recent paper, has therefore been thrust into the background by the abduction method. It is claimed that the more accurate adjustment that may be attained under direct inspection, and the greater security assured by a peg of bone or metal, will hasten repair and thus lessen the period of restraint. On the other hand, the presence of a foreign body must impair the nutritive capacity of the cancellous tissue of the neck and, if there were an absorption of bone about the fracture—apparently not an unusual preliminary to repair—the fragments would be actually held apart by the means designed to appose them.

The primary open operation is relatively a minor issue, since it is limited to one type of fracture and to selected cases. Even under these conditions it is questionable whether the greater percentage of repair as compared with the results attained by the abduction method, conducted under equally favourable conditions, will justify the operative risk.

Indications for the Abduction Method.

The abduction treatment which has extended the range of effective treatment to the aged class has expanded it in far greater degree in what was formerly an unknown region, that of childhood and adolescence. In childhood the direct fracture is usually of the greenstick type, "traumatic coxa vara," which may be readily corrected if the diagnosis is made within a reasonable time; otherwise the shaft should be divided at the level of the trochanter and abducted to the degree that corresponds with the angle of the neck, thus restoring indirectly its normal inclination when, after consolidation, the limb is replaced in the line of the body. The abduction method is effective for the epiphyseal fracture, and also for the incomplete so-called epiphyseal slipping of adolescence if seen in the early and progressive stage. In neglected or resistant cases the open operation will be required for the replacement of the head in its proper relation to the neck.[19] It is also the most effective treatment for the relatively rare cases of fracture of the acetabulum with inward displacement of the head.[20]

Finally, there are many cases of ununited fracture of long standing in which the destruction of the neck makes the ordinary pegging operation impracticable. In such cases what has been called the reconstruction operation is the most effective procedure. The trochanter is separated at its base, thus providing a sufficient area of bearing surface and, the head having been removed, the improvised neck is inserted in the acetabulum at an angle of about 25° of abduction and the trochanter with its attached muscles is transplanted to the outer border of the shaft; thus muscular control, a fair range of motion, and security of support are established.[21] ‖

From this review it should appear that fracture of the neck of the femur in a comprehensive sense is now fairly under surgical control. Since, therefore, it is amenable to the rules that govern the treatment of other fractures, it is entitled to the same consideration and protection. The official sanction of this self-evident proposition will establish the positive standard and the abduction treatment as its exponent. For with the means at command one who cannot produce evidence that he has made success possible will be responsible for the result.

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‖ These various procedures are described in detail in a Treatise on Orthopædic Surgery, Whitman, Philadelphia, 9th ed., 1930.

A BIRMINGHAM CONVALESCENT HOME. — On Sept. 19th Sir Charles Hyde laid the foundation-stone of a new convalescent home which is being erected by the Birmingham Hospital Saturday Fund, at a cost of £50,000 at Kewstoke, near Weston-super-Mare. This is the seventh convalescent home provided by the Fund.

BLOOD-SUGAR STUDIES IN ABNORMAL MENTAL STATES.*

By P. K. McCowan, M.D. Edin., M.R.C.P. Lond., D.P.M.,
MEDICAL SUPERINTENDENT OF THE CARDIFF CITY MENTAL HOSPITAL;
AND
J. H. Quastel, D.Sc. Lond., Ph.D. Camb., F.I.C.,
DIRECTOR OF THE RESEARCH LABORATORIES OF THE HOSPITAL.

A survey of papers bearing on sugar tolerance in psychotic subjects reveals a state of some confusion. Upon two points there is general agreement: (1) The fasting blood-sugar levels of psychotic subjects are generally within normal limits [Mann (1925), Mann and Scott (1929)]. Bowman and Kasanin (1929) conclude "that there is no correlation between the mood of the patient and height of blood-sugar; various other factors might account for a great many instances of high blood-sugar curves." On the other hand Kooy (1919) states that in melancholia "it is the emotional state that is responsible for the high amount of blood-sugar." (2) Disordered carbohydrate metabolism (i.e., a lowered sugar tolerance) is very frequently found in psychotic subjects.

Beyond these two facts there is little that is clear.

The reason for this state of confusion is not difficult to perceive. In the first place, the usual habit has been to make a single test of the sugar tolerance of the patient and relate this to the type of psychosis with scarcely any reference to the physical condition at the time the test was made—e.g., the presence or absence of menstruation, toxæmia, and endocrine disbalance. In the second place, there has usually been an insufficient description of the mental condition of the patient *at the time* of the test. It is easy to see how the examination of a large number of patients, carried out in a statistical manner, and with little reference to their clinical and mental condition at the precise time of examination, may give rise to a series of sugar-tolerance curves having no apparent relation to the type of psychosis present. Such examinations carried out in an extensive manner seem fruitless, and should be replaced by serial examinations, each patient being repeatedly examined in different phases of his illness. It will be shown that, in the absence of certain physical conditions, an abnormal sugar tolerance bears the closest connexion with the emotional tension of the subject. This is so much the case that with many patients the progress of the change in sugar tolerance may be watched with confidence as a guide to the emotional condition of the patient, and to the efficacy of his treatment, and as a valuable aid in deciding the time of his discharge from hospital.

Throughout the work the well-known method of Hagedorn and Jensen has been used for the estimation of sugar in blood. For information on a typical sugar-tolerance curve, the effects of the administration of various quantities of glucose, &c., the paper of MacLean and de Wesselow (1920) should be consulted. It is clear from the results, as a whole, that in normal subjects following a 50-g. glucose meal, there is a relatively rapid rise of blood-sugar to a value which may vary from 0·15–0·21 per cent. and a return to the normal fasting level within two hours. The return to the fasting level *within two hours* is the most constant finding in all normal cases, and occurs whatever the height to which the blood-sugar has ascended.

* A complete report of these studies appeared in the Journal of Mental Science for July.

Hyperglycæmic Index (H.I.).

It was found, at the beginning of the work, a difficult matter to contrast various sugar-tolerance curves without some measure of expressing the departure of such curves from those usually found in the normal case. The commonly used term "abnormal sugar curve" is vague, and may apply to cases where the blood-sugar has risen to excessive heights and yet fallen to a normal fasting level within two hours; or to cases where the blood-sugar has risen in a normal manner, but *not* fallen to the fasting level within two hours; or to cases where the blood-sugar has scarcely risen at all. Clearly, an abnormality may occur in more than one direction; and it is probably for this reason that no attempt has so far been made to express the abnormality of a sugar curve in a quantitative sense.

It was quite obvious that the abnormality, as a general rule, exhibited itself as a sustained hyperglycæmia. This did not mean that the blood-sugar level rose necessarily to a level greater than that which obtained in normal cases, but that the blood-sugar level *did not return to normal within two hours*. This was the most constant finding in all abnormal sugar-tolerance curves. It seemed therefore that a quantitative expression of the extent of the abnormality of the sugar curve could be found in its delay to return to the normal fasting level. The most abnormal condition of the curve would be when the sugar level was at its *highest* value at the end of the two-hour period; and the curve would be deemed normal when the sugar level was at the fasting value after the two hours.

A quantitative expression of the amount of sustained hyperglycæmia, exhibited in an "abnormal" curve, can be given as follows:—

$$\text{H.I.} = \frac{\text{Two-hour blood-sugar level} - \text{Fasting level}}{\text{Maximum blood-sugar level} - \text{Fasting level}} \times 100$$

where H.I. represents the measure of sustained hyperglycæmia, and is conveniently referred to as the hyperglycæmic index. The maximum blood-sugar level is the maximum level to which the blood-sugar rises within two hours of ingestion of the glucose.

It will be seen that the index is 100 when the blood-sugar level has, after the two-hour period, only just (or not yet) reached its maximum peak after the sugar ingestion. It is zero when the curve is a normal one. The index has the advantage that it is independent of the absolute magnitude of the fasting level, and, being a ratio of two differences in sugar levels, is a function only of changes in the actual quantities of glucose in blood. Further details concerning the measurement of H.I. are to be found in our complete report (McCowan and Quastel, 1931).

An H.I. above zero but below 10 may be considered normal, for the experimental errors involved in collecting blood and estimating blood-sugar, though small, are such as to give an index possibly as high as 10. An index between 10 and 50 shows definitely a sustainment of hyperglycæmia, whilst one above 50 shows a condition indicative of a severe disturbance in carbohydrate metabolism.

SUGAR TOLERANCE WITH NORMAL MEN AND WOMEN.

Although the normal curve has been previously exhaustively studied, it was felt that on general principles a number of normal men and women should be examined, with the object of discovering

whether the sugar-tolerance curve remained the same in each individual after examination on several occasions. Six male nurses and six female nurses in the Cardiff City Mental Hospital kindly volunteered for the work.

Normal results have been found with the male nurses, who all gave an H.I. between 0 and 10. A different state of affairs exists with women. It was found, at first, that whereas two or three of the women gave normal curves the others gave abnormal ones, their H.I.'s being high. The magnitude of the H.I. was increased, owing to the fact that the maximum rise in blood-sugar was relatively small. On repetition of the test, it was found that those who were previously abnormal had become normal, and that one or two of those who were previously normal had become abnormal. On carrying out the test a third time, this state of affairs was repeated.

It was apparent that the departures from abnormality could not be related to obvious physical or mental disorder, and it was clear, too, that the abnormalities were confined to the women and not to the men. A possible explanation was that the abnormal sugar tolerance was connected with menstruation; and this proved to be the case. This is shown in Table I.

TABLE I.

Case.	Date in 1930.	Relation to menstruation.	Blood-sugar mgms. per cent.						H.I.
			Fasting level.	½ hr.	1 hr.	1½ hrs.	2 hrs.	3 hrs.	
1	Mar. 17th	+14	96	133	92	104	97	92	0
	Apr. 2nd	0	113	188	134	133	131	110	24
	May 8th	+ 7	114	156	168	145	106	101	0
2	Mar. 17th	+14	94	106	122	105	90	86	0
	,, 24th	0	99	135	110	124	113	108	30
	May 9th	+20	94	135	110	118	94	84	0
3	Mar. 14th	0	100	133	133	125	115	88	45
	,, 27th	+14	110	138	135	99	105	105	0
	Apr. 25th	+ 7	127	166	129	153	111	111	0
4	Mar. 13th	A*	108	117	120	111	100	96	0
	,, 19th	− 3	108	152	104	94	94	88	0
	May 7th	0	111	162	129	126	127	110	29

Col. 3.—A* Case 4: amenorrhœa for four months. The numbers in this column indicate days before onset (−) and days after cessation (+) of menstruation, 0 indicating actual menstruation.

Careful inquiry showed that, apart from Case 4, who had had amenorrhœa for four months before her first test, menstruation was perfectly normal in these nurses, and in all cases quite unaccompanied by any physical or nervous upset.

It is clear from this effect of the menstrual cycle on sugar tolerance that many of the abnormal curves which have been reported in female psychotic patients may well be vitiated if done without reference to the presence or absence of menstruation. That the blood-sugar curves of female psychotics are similarly affected will be shown later. Care has been taken in the present investigation to make the examination at intermenstrual periods in female subjects.

The results of this investigation with 85 patients will now be considered under their respective psychoses.

MANIC-DEPRESSIVE INSANITY, INCLUDING INVOLUTIONAL MELANCHOLIA.

Fifty-two of the patients came under this category —namely, 43 melancholics, 4 manics, and 5 benign stupors. A few of the 43 melancholics showed manic phases while under investigation. Table II. shows the results obtained in this group of patients. It indicates the relatively high incidence of melancholic patients exhibiting an H.I. of over 50 and a relatively low incidence of these patients (7 out of 43) who consistently give an index of zero.

TABLE II.

Case.	Sex and age.	Diagnosis.	Hyperglycæmic index.	Remarks.
1	F. 49	Involl. melan.	57, 34, 0.	Disc. rec.
2	F. 54		24, 69, 19, 77.	Still in hosp.
3	F. 59		50, 0.	Disc. rec.
4	F. 48		86*, 38.	*Menstruating.
5	M. 53		54, 52*.	*Stuporose.
6	F. 47		54, 54, 37, 39, 81, 0, 0.	Disc. rec.
7	F. 46		40,0,0,0,100,16,13,0.	,,
8	M. 57		94,86,100,100,53,76.	No imp.
9	M. 63		65, 22, 45, 100.	,,
10	F. 56		0, 0.	Died from exh.
11	F. 49		13, 9.	Bad prognosis.
12	F. 45		14, 0, 44*, 12.	*Special upset.
13	M. 55		0, 0.	Bad prognosis.
14	F. 46	Agit. melan.	90, 51.	Died from exh.
15	F. 44		42, 60.	—
16	F. 56		100, 57.	—
17	F. 56		23.	—
18	F. 41		8, 0.	Died from exh.
19	M. 50		0, 0.	Bad prognosis.
20	F. 47	Recent melan.	100.	—
21	M. 36		77, 24, 11, 40, 24, 0.	Disc. rec.
22	F. 48		67, 78*, 12, 0.	*Menstruating.
23	F. 22		70, 0.	Disc. rec.
24	F. 40		100, 0.	,, Died from ch. neph.
25	M. 28		67, 0.	Disc. rec.
26	M. 37		0, 14, 0.	Depressed (*a*).
27	M. 40		0, 0.	Bad prognosis.
28	F. 49		33*, 12.	*Vaccinated.
29	F. 32	Recurr. melan.	90, 0, 0.	Disc. rec.
30	F. 45		80, 100.	No imp.
31	M. 18		100.	—
32	F. 58		100, 56, 62, 45.	Still in hosp.
33	F. 31		63, 25, 0.	Disc. rec.
34	F. 39		0, 80*, 34.	*Menstruating.
35	F. 31		40*, 17, 40**.	* ,, **Relapsed.
36	F. 35		0, 0, 0*.	*Menstruating (*b*).
37	F. 48		33, 0.	Disc. rec.
38	F. 61	Chron. melan.	31, 87, 72.	Ch. arthritis.
39	F. 50		48, 50.	—
40	F. 62		0, 0.	Bad prognosis.
41	F. 27	D. Ep.	0.	Adlerian mechanism.
42	F. 44	Melan. & mania.	100*, 77, 7**, 93, 39.	*Menstruating. **Mania.
43	F. 33		50, 0*.	*Mania.
44	M. 53	Recent mania.	14, 74, 0.	—
45	M. 72		0.	Senile dementia.
46	F. 23		14.	Schizoid.
47	M. 54	Recurr. mania.	0.	—
48	F. 18	Benign stupor.	37, 0.	—
49	F. 22		20.	—
50	F. 62		28.	—
51	F. 35		14, 100*, 0, 0, 0, 0.	*Vaccinated.
52	F. 17		0, 0.	—

(*a*) Depressed on each occasion; bad prognosis.
(*b*) Adlerian mechanism in ament.
D. Ep. = depression in epileptic. Disc. rec. = discharged recovered. No imp. = no improvement. Exh. = exhaustion. Ch. neph. = chronic nephritis.

It is in the group of cases belonging to the manic-depressive psychosis that the sugar-tolerance test gives results of greatest practical importance. Here it is possible to understand the significance of the H.I. and to interpret it in clinical terms. Generally speaking, it is found that the height of the H.I. is a criterion of the emotional tension of the patient at the time of the actual test. In fact, in the series of figures given in Table II. it was always possible to correlate any change in the index with a change in the emotional tension of the patient.

MELANCHOLIA.

(*a*) *H.I. as a guide to clinical progress.*—By means of the index we can gauge the progress of a melancholic patient without having to depend entirely on the clinical picture. This is particularly important in those by no means rare cases when it is difficult

to say if our melancholic patient has really returned to normality or is only pretending to have done so with a view to early discharge—it may even be with the concealed determination to commit suicide if such discharge takes place.

Cases 10, 11, 13, 18, 19, 26, 27, 36, 40, and 41 constitute a group of 10 melancholics, who, in spite of apparent depression, give a normal or only slightly abnormal H.I. It was some considerable time before an explanation of these apparently anomalous results offered itself. It was Case 18 which gave the first clue. Here was a woman, apparently extremely agitated and depressed and, at first sight, under considerable emotional tension, whose H.I. was quite low. In making a critical examination with a view to discovering in what way this patient differed from the usual melancholic, one was struck by her histrionic behaviour, which suggested that there was a considerable hysteriform element in her psychosis. That this clue was significant is supported by the fact that this hysteriform element has been found to be very generally associated with a low index, and that it was always present in melancholics with a low index. It is, of course, a moot point whether the hysteric actually feels the emotion he proclaims, or whether there is absence of depth in his emotion owing to absence of the secondary reverberatory phenomena associated with emotion. This latter hypothesis was postulated by Golla in his Croonian Lectures of 1925, and findings corroborative of it have been obtained by one of us (McCowan, 1926). As this hypothesis seems to fit in very well with the present findings, it may be permissible to attempt to bring it into agreement with the more generally accepted hypothesis of Jung—that the hysteric is a feeling extrovert, the contention being that the hysteric, far from being devoid of emotion, actually guides his life by it. It may be admitted that the hysteric is a feeling extrovert, but with the proviso that his emotions are not accompanied by the usual secondary reverberations due to vasomotor and other changes. This gives him his well-known feeling of voidness of emotion and want of inner satisfaction; and this, in turn, brings his thinking into play to tell him how he should feel and behave in any given circumstances; but, as he is a feeling extrovert, it follows that the thinking thus aroused comes from his unconscious and is, consequently, primitive and undifferentiated. It is characteristic of phenomena which derive their driving power from the unconscious that they are unadapted and archaic; and certainly this fits in well with the symptoms manifested by the melancholics under discussion.

Work being done in the psychological laboratory at the Cardiff City Mental Hospital by Dr. M. R. Lockwood on several of the patients in the present series is showing that the psychogalvanic reaction runs parallel with the H.I. It is being found that the hysteriform melancholic, like the ordinary hysteric, fails to give evidence of emotion as recorded by the psychogalvanometer.

The following case is illustrative of this type of patient.

CASE 18.—Married. Aged 41. Housewife. Admitted Jan. 10th, 1929, with history of recent onset.

Diagnosis: agitated melancholia.

Physical: nothing of note.

Mental: house-proud woman, who had severe blow to her pride when her husband lost a good position owing to some petty swindling. A week prior to admission she developed delusions that her husband was unfaithful, did not want her and was trying to poison or hang her. She cut her wrists in what she pretended to be a suicidal attempt, and was continually praying for herself and others. She gradually improved for three months, but then relapsed into an acutely agitated state with all her former symptoms greatly exaggerated. She required tube-feeding at times; self-pity was very prominent, and her praying and agitation were very theatrical and much exaggerated when anyone was present. The unconscious motive of her psychosis was probably a desire to escape from a mode of life and a husband she had come to hate. This was her condition when her sugar-tolerance test was done on Dec. 18th, 1929. Her H.I. was 8. She was emotional and disturbed during the experiment. On repetition later her H.I. was 0.

She continued extremely agitated until her death from lobar pneumonia on Jan. 26th, 1930.

The prognosis in the cases of melancholia who have given a consistently low H.I. is of interest. Excluding Cases 36 and 41, who are aments whose attacks of depression were merely expressions of the Adlerian "will to power" and almost bordered on malingering, there are left eight cases whose psychoses have run an extremely bad course. While the number of cases is much too small on which to dogmatise, certain it is that we at our hospital have come to regard a persistently low H.I. in an agitated melancholic as of extremely bad omen. Death or chronicity has been the invariable fate of such cases.

(*b*) *Emotional state at time of test.*—The following case shows very well the importance of the emotional state of the patient at the actual time of the test. While in the majority of the cases the mood of the case is such that the H.I. is fairly constant from day to day, the following patient's emotions were in such a labile state at one period of her illness that it was possible to test the result of a temporary emotional upset.

CASE 7.—Married. Aged 46. Housewife. Admitted May 10th, 1930, with a history of seven months' illness.

Diagnosis: involutional melancholia of reactive type.

Physical: nil of note.

Mental: appears to have worried much recently about her mother's death in a mental hospital and over the drinking propensities of her husband.

On admission she was full of self-pity and at times very agitated and emotional. She insisted that her husband had had her "put away" for his own purposes. This was her condition on May 19th, 1930, when the H.I. was 40. She improved quickly, and soon showed little sign of depression or anxiety, though still very resentful against her husband. This was her condition on June 4th, 1930, when the H.I. was 0. She was much quieter and more settled than during the last test.

She was taken out "relieved" on June 27th, 1930, but returned on July 14th because she had become very depressed and agitated, threatening suicide if not returned to hospital. She soon settled down, and maintained that her relapse was due to her husband's drinking habits, that he had come home the worse for drink every night and insisted on sharing her bed. She felt she would relapse if again returned to him. This story was corroborated by her daughter.

On Sept. 24th, her H.I. was 0. She was quiet and coöperative during the test. About this time she always became very distressed when her relations with her husband and her return to him were discussed, and it was decided to see if this had any effect on her sugar-tolerance curve. Accordingly, a test was done on Oct. 22nd, 1930, and her H.I. was normal. On the following day the test was repeated; but before the test was begun her relations with her husband were fully discussed, in order to stir up any emotional tension relevant to this. Her H.I. then became 100.

Her husband committed suicide shortly after this, an event which quite pleased the patient, who thought it would make life more pleasant for herself and family. At this time, viz., Nov 19th, her H.I. was found to be 16. The next day the test was repeated, following a discussion of her future, but on this occasion there was no clinical upset, and the H.I. was 13. On Dec. 10th her H.I. was 0. This test was done just prior to her going on a period of trial, to make certain that the prospect of leaving hospital no longer caused the emotional upset which it had done when her husband was alive.

MANIA.

Most workers state that in mania sugar tolerance after glucose ingestion is normal. This is not altogether true. We have found in the cases investigated (Table II., Cases 42–47, both inclusive) that,

while the ordinary cheerful manic patient gives a normal sugar-tolerance curve, this is not so if the excitement is accompanied by an aggressive, paranoid mood. In this respect the H.I. and the psycho-galvanic reflex are again in parallel, as the latter is only obtained as a response to noxious stimuli and unpleasant emotions.

STUPOR.

The results obtained in cases of benign stupor failed to support the contention of most workers that in such patients sustained hyperglycæmia is obtained with great constancy and in its most severe forms.

The present remarks deal with five cases of benign stupor (Table II., Cases 48–52, both inclusive), one of them an interesting example of a manic stupor.

Stupor may be regarded as a defensive mechanism which aims at a complete withdrawal from reality, and, if successful, there should be a release from emotional tension, with a resultant normal H.I.

In all our cases, normal or low figures were obtained, and in but one was a figure as high as 37 recorded. It would appear therefore that the defensive mechanism of the stupor reaction had succeeded in most cases in abolishing the emotional tension.

SCHIZOPHRENIA.

Twenty-nine of the patients came under this category—namely, 11 hebephrenics, 10 catatonics, 5 paranoids and 3 full dements. Table III. shows the results obtained in this group of patients.

TABLE III.

Case.	Sex and age.	Diagnosis.	Hyperglycæmic index.	Remarks.
53	F. 28	Hebephrenia.	76, 5, 52.	Ch. sinusitis.
54	M. 17		49, 56, 93.	Deteriorated.
55	M. 26		17, 19, 50*, 0, 0.	*Very agitated.
56	M. 26		36, 0, 11, 91*.	*Very unsettled.
57	M. 22		10.	Deteriorated.
58	F. 33		0.	—
59	F. 27		0, 0.	—
60	F. 26		0.	—
61	F. 33		24.	—
62	F. 54		8.	—
63	M. 35		20.	—
64	M. 18	Catatonia.	40, 95, 0, 15.	Stupor.
65	M. 34		0.	,,
66	M. 21		0, 0, 0.	Diff. phases.
67	M. 24		0.	Stupor.
68	M. 29		0, 0.	,,
69	M. 47		0.	Deep, neg. stupor.
70	F. 26		0, 0.	Not stup. at test.
71	F. 22		100, 100.	Mildly stuporose.
72	M. 25		28, 0, 0, 0.	Deteriorated.
73	M. 30		0.	,, —
74	M. 55	Dem. paranoides.	16.	
75	F. 30		0, 21*.	*Menstruating.
76	M. 23		35*, 0, 0.	*Vaccinated.
77	M. 29		0.	Deteriorated.
78	M. 35		12.	Agitated phase.
79	M. 29	Dull dementia.	19, 32.	—
80	F. 49		0.	—
81	M. 19		14.	—

Ch. = chronic. Diff. = different. Neg. = negativistic. Stup. = stuporose.

An examination of this Table shows (in contrast to Table II.) the high incidence of patients with a normal index, and the relatively low incidence (2 out of 29) of patients showing an index consistently greater than 50. This is entirely in keeping with our conclusion that emotional tension is accompanied by a rise in the H.I.

There is little doubt, however, that the H.I. does not give the same help to the clinician in diagnosis and prognosis in the schizophrenic as it does in the manic-depressive group. Schizophrenics under emotional tension certainly show a sustained hyperglycæmia; but, on the other hand, a similar hyperglycæmia is not uncommonly obtained when emotional tension is most certainly not present. In a certain proportion of these latter cases a probable cause of the raised H.I. can be found in such factors as toxæmia; but, in the majority, no such cause is apparent. It is highly probable that the well-known endocrine disturbances of this disease are causal of the disordered carbohydrate metabolism. It is noteworthy that the index often varies at different times in the same patient without any apparent change in the physical or mental condition. A characteristic feature of many of the blood-sugar curves in this group is their low maximum level. This results in a tendency for the index to be high, as it varies inversely with the maximum level; and this undoubtedly mitigates against the value of the index when applied to cases of schizophrenia. There was no appreciable difference in the sugar tolerance of the various clinical types (see Table III.).

Our results with catatonic stupors are distinctly contradictory to those of Mann in failing to show any sustained hyperglycæmia. Of the ten catatonics, seven were in a state of definite stupor at the time of their examinations, and with two exceptions all these stupors gave normal index figures. In one of the exceptions (Case 64) the figures varied from normal to high without discoverable reason.

ARTERIO-SCLEROSIS.

According to Spence (1920), arterio-sclerosis and advancing years are always accompanied by a sustained hyperglycæmia of appreciable dimensions. Our results are by no means wholly in support of this contention. In the present series (Table IV.) there were seven cases of arterio-sclerotic dementia showing different mental pictures. In four of these, consistently normal figures were obtained. In one (Case 85) an index of 38 was obtained, while he was in a confused state; but a normal index was found when his confusion cleared, leaving only a simple dementia. In the other two, more or less consistently high figures were the rule. In one of these (Case 82), the patient while in a stuporose phase gave a normal index figure; but, on passing out of this phase into one of apathy with depressive thoughts, she gave high figures. We were satisfied that her high figures were not due to emotional tension. In the other case (No. 83), a complete recovery from her confused, agitated state was not accompanied by any fall in the H.I. In spite of these two cases, however, it is clear that arterio-sclerosis per se cannot be held to be a cause of a lowered sugar tolerance.

The above remarks apply particularly to cases of cerebral arterio-sclerosis, but others of our patients suffering from different forms of arterio-sclerosis gave results which bear out our present contention. Table IV. deals with the seven cases of arterio-sclerotic dementia.

TABLE IV.

Case.	Sex.	Age.	Mental state.	Hyperglycæmic index.
13	M.	55	Depressed.	0,0.
45	M.	72	Manic.	0.
82	F.	53	Apathetic.	0, 57, 82.
83	F.	70	Agitated.	75, 59*, 73*.
40	F.	62	,,	0, 0.
84	M.	60	Grossly confused.	0, 0.
85	M.	46	Confused.	38, 0.

* No depression.

MENSTRUATION.

Owing to the results obtained with the controls, it was considered of interest to see the effect of

menstruation on the H.I. of some of our patients, and the results obtained clearly demonstrate how entirely unreliable must be regarded any blood-sugar work on psychotic women where the effects of menstruation have been overlooked. Seven patients were investigated, and in six the H.I. was found to be higher during the menstrual as compared with the intermenstrual period—and this, irrespective of the type of mental disease present. Table V. shows the effect of menstruation on the H.I. of these seven patients.

TABLE V.

Case.	Diagnosis.	Intermenstrual H.I.	Menstrual H.I.
4	Involl. melan.	38.	86
22	Recent melan.	12, 0.	78
34	Recurr. melan.	34.	80
35	,, ,,	17.	40
36	,, ,,	0, 0.	0
42	Melan. and mania.	77.	100
75	Dem. paranoides.	0.	21

With the exception of Case 34, menstruation had no noticeable effect on the mental state of these patients.

VACCINATION.

Vaccination is done as a routine prophylactic measure at our hospital, and it was thought of interest to see how this, as representative of an extraneous type of complication, would affect sugar tolerance. Table VI. gives the effect on the H.I. of the three patients tested. The vaccination had no apparent effect on the mental state of these patients, so that the raising of the index cannot be due to an increase of emotional tension.

TABLE VI.

Case.	Diagnosis.	H.I. apart from vaccination.	H.I. during vaccination period.
28	Recent melan.	12.	33
51	Benign stupor.	14, 0, 0, 0, 0.	100
76	Dem. paranoides.	0, 0.	35

TOXÆMIA.

During the course of this investigation it became apparent that some of the anomalous results obtained, especially in the schizophrenic group, were due to the presence of toxæmia; and it is a permissible surmise that some others were due to an undiscovered infection, though, as previously stated, the probability is that in schizophrenia endocrine imbalance is the more usual factor in giving a raised index in the absence of emotional tension. The following case shows clearly the possible effect of toxæmia.

CASE 53.—Single. Aged 28. Housework. Admitted April 18th, 1929, with a history of some months' illness. Diagnosis: hebephrenia.

She was hallucinated, extremely irrational, and largely inaccessible. She had regressed to a childish state, and was always playing with dolls and attempting to kiss other patients. The rhinologist reported pus in the right antrum, and it was decided to operate. On Sept. 24th, 1929, intranasal drainage of right antrum was performed; left antrum showed mucus on proof puncture; left middle turbinate was removed and ethmoids drained; sphenoids were clear. This operative treatment resulted in no appreciable mental improvement, but her physical health improved and her weight increased from 6 st. 7 lb. to 7 st. 8 lb. Her sinusitis not having cleared up, it was decided again to operate. On the day previous to operation—viz., Feb. 10th, 1930, her H.I. was 76. After operation she showed some general physical and a slight mental improvement. Her sugar tolerance was tested on April 16th, and her H.I. had fallen to 5. But her improvement only lasted a very few months, and by the time of her next test on August 29th, 1930, she had relapsed to her former mental state; and she now had an unpleasant discharge from her nose and other evidence of a recurrence of her sinusitis. Her H.I. had now risen to 52. There is, therefore, little doubt that in this case the two abnormal sugar figures were due to the toxæmia present.

Conclusion.

While theorising on insufficient premises is to be deprecated, it is permissible to offer a tentative explanation of the parallelism between the emotional tension and the H.I. in manic-depressives. The interference with carbohydrate metabolism is doubtless a secondary phenomenon incidental to the bodily changes which accompany emotion, and the following hypothesis falls into line with the theories of W. B. Cannon on this subject. Emotional tension may be accompanied by an outpouring of adrenalin as a defensive mechanism, and the presence of this substance in the blood would certainly account for a sustained hyperglycæmia after sugar ingestion. Whether the same mechanism accounts for the hyperglycæmia in toxæmia and other conditions and during menstruation is, of course, more doubtful; but it can at least be surmised that the abnormality is due to some endocrine imbalance. Still more is it likely that in dementia præcox we are dealing with various factors in the causation of the abnormal sugar metabolism; though, again, the most likely explanation probably lies in an endocrine imbalance.

Whether this explanation is right or not remains a matter for further investigation. The practical issue, however, is clear—for the parallelism which exists between the emotional tension and the magnitude of the H.I. offers a most useful means of study of, particularly, the manic-depressive disorders. It is most valuable as an aid in following the treatment and the progress of this class of psychotic subject.

Possibly the times at which a determination of the H.I. is of greatest service to the clinician are:—

(*a*) *On admission* of the patient. A high index in a frankly manic-depressive disorder would indicate considerable emotional tension. If the index and the clinical behaviour do not coincide there would be reason to suspect a hysteriform element in the patient, and, from the results stated in this paper, this would indicate a bad prognosis.

(*b*) *Just before discharge* of the patient. The index should be zero on discharge of the patient. Even if the clinical condition would seem to warrant discharge of the patient, it may happen—as shown in this paper—that the index is high; and the discharge of such a patient would be attended with considerable danger. A number of zero indexes obtained prior to discharge of the patient appears to be the most reliable method of indicating recovery.

It is essential in work of this description that the closest coöperation exist between clinician and laboratory worker; for, often enough, an anomalous result is obtained whose interpretation is only clearly seen in the light of the experience of both workers. There is little question that an unexpected result frequently gives a most valuable insight into the mental and physical condition of the patient.

Summary.

1. A study of the sugar-tolerance curves of 85 psychotic subjects has been made.

2. The hyperglycæmic index is defined. It is a quantitative measure of the departure of a sugar-tolerance curve from that found in a normal case. It is an expression of the sustainment of hyperglycæmia found in many psychotic cases. The index is referred to as H.I.

3. It is shown: (*a*) That in the manic-depressive

group there is the closest parallelism between the magnitude of the H.I. and the emotional tension of the patient. Out of 43 melancholic patients examined, only ten gave a normal or slightly abnormal index. An explanation is given for this anomalous behaviour of the ten patients. (*b*) That in the schizophrenic group there is a relatively low incidence of patients (2 out of 29) showing an index consistently greater than 50. High figures in the schizophrenic group are associated with toxæmia, endocrine imbalance, or other physical disorder.

4. In cases of mania a low index is recorded, except when the excitement is accompanied by an aggressive, paranoid mood.

5. In cases of benign stupor a low index has been recorded, showing that the defence mechanism of the stupor reaction had succeeded in abolishing the emotional tension.

6. Arterio-sclerosis per se is not a cause of a high H.I.

7. During menstruation there is a departure from the normal sugar-tolerance curve in both normal and psychotic cases.

8. Practical use is made of the H.I. in determining prognosis, progress, and recovery of the patient.

We would like to express our appreciation of the cordial help given us by the medical officers in charge of the patients, our indebtedness to the Medical Research Council for a grant in aid of equipment, and our appreciation of the services of Mr. A. Dignam.

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SPASMUS NUTANS

(HEAD-NODDING) AS ASSOCIATED WITH DEFECTIVE LIGHTING IN THE HOME.

By DONALD PATERSON, M.D. EDIN., F.R.C.P. LOND.,

PHYSICIAN TO OUT-PATIENTS' DEPARTMENT, HOSPITAL FOR SICK CHILDREN, GREAT ORMOND-STREET; AND PHYSICIAN FOR DISEASES OF CHILDREN, WESTMINSTER HOSPITAL;

AND

R. W. B. ELLIS, M.D. CAMB.,

FIRST ASSISTANT AND REGISTRAR TO THE CHILDREN'S DEPARTMENT, THE LONDON HOSPITAL; LATE WANDER SCHOLAR, WESTMINSTER HOSPITAL.

THE condition of spasmus nutans, or head-nodding, occurs in infancy, and is usually associated with a peculiar type of nystagmus. Involuntary head movements begin in the great majority of cases when the baby is between 3 and 12 months of age, and usually during the darkest months of the year. The onset of the nodding is preceded or followed by a rapid nystagmus, which may be of lateral, vertical, circular, or varying type. A peculiar feature of the nystagmoid movements is that they are often limited to one eye, or of different types in the two eyes.

The clinical picture is characteristic: a pale and generally rachitic baby of the hospital class, who shows no abnormal head movements when lying flat in the cot, but who, when sat up, commences regular antero-posterior (nodding) or lateral (shaking) head movements, accompanied by any of the types of nystagmus previously mentioned. The movements are lessened or cease entirely when the child's attention is attracted, though the nystagmus frequently persists. Thomson [1] comments on a trick many of these infants have when regarding a fixed object—viz., turning the head away from it and looking at it from the corners of their eyes. The condition is not associated with any evidence of spasmophilia, and recovery is complete, although cases of persistent strabismus have been recorded. The usual course is from six to eight months.

Since the condition usually arises during the period in which the normal infant is learning to control and coördinate ocular movements by means of visual impressions, it has been described as a "functional coördination neurosis" (Thomson [2]). The striking differences which may exist in the movements of the two eyes are understandable on this basis.

In considering the ætiology, many observers have been struck firstly, by the frequent association of the condition with rickets; secondly, by its extreme rarity in children of the well-housed classes; thirdly, by the frequent onset in the darkest months of the year; and, finally, by the fact that there is defective lighting of the child's dwelling-room. Raudnitz,[3] in 1897, was the first to suggest defective light as the causa causans, and his theory has received considerable support, though severely criticised by Still.[4] The latter author reported a series of 34 cases, in 24 of which the rooms appeared reasonably light, and referred to the occurrence of the condition in the child of a medical man living in a well-lighted nursery. It is possible that the position of the child's cot in relation to the source of light may have had some influence on the condition in these cases.

It is of interest in this connexion to compare the condition with that of miners' nystagmus. While this latter is directly associated with defective illumination of the coal-face, the incidence of disability has increased rather than diminished since the introduction of the one-candle-power electric lamp, and those who hold defective illumination as the primary cause of the condition have suggested (Roche [5]) that this apparent anomaly is explained by dazzle and after-image phenomena. A similar explanation might hold for spasmus nutans developing in children continuously exposed to direct dazzle—e.g., from a skylight placed directly above the cot of a child in an apparently well-lighted room. The most generally accepted theory of the mechanical causation of miners' nystagmus is that in dim light "the eye must move 15 or more degrees from the mid-point to obtain the image of an object" (Cooke [6]), since under these circumstances the retina functions by means of the rods rather than the cones, and no rods exist at the fovea centralis. Prolonged exposure to defective light results in nystagmus from loss of voluntary control of the extrinsic eye muscles involved. The nystagmus of spasmus nutans is closely comparable, but here there is, instead of a *loss* of voluntary control, a failure to establish it. In the course of time the growing organism succeeds in doing so, and recovery takes place.

CASE RECORDS.

The following four consecutive cases are reported as exemplifying the clinical phenomena of the condition, and also its very close relationship to defective lighting.

CASE 1.—Male, fourth child, mother and father and one sibling alive and well. One sibling died of pneumonia, one at six weeks (? cause). No miscarriages or stillbirths. Breast-fed for three months, then given a cow's milk formula with added sugar. Since birth the baby has been kept in a top back room, from which the light was almost entirely cut off by a wall five feet from the window. The room was so dark that the gas had to be lighted at any time of the day when the mother was attending to the baby. The baby lay parallel to the window, with face toward the gas. When he was three months of age (at the end of March, 1930) the mother noticed the onset of lateral head movements and nystagmus. These still persisted when the child came under observation on account of broncho-pneumonia at 11 months of age. At this time there was almost continuous nystagmus when the child was sitting up, and intermittent head movements. The nystagmus was principally of lateral type, though occasional vertical and oscillatory movements occurred, and it appeared to be equally marked in both eyes. The child was extremely pale, and showed evidence of severe rickets.

July, 1931: Now aged 1 year 4 months. His general condition has greatly improved; eye and head movements have ceased.

CASE 2.—Female, first child. Family lives in two small basement rooms, the baby having been kept since birth in the back room, which is the darker of the two. The baby lay with her head toward and feet away from the window, most of the light being shut off from her cot by the mother's bed. When taken out of doors she was left in the pram with the hood up at the bottom of the area. At 10 months old (during March, 1930), patient was noticed to have unilateral nystagmus of the left eye. Nystagmus was of lateral type, and was never seen to occur in the right eye. Patient was brought to hospital in July, 1930, and, at that time, was found to have severe rickets. Admitted to Carshalton with gross genu varum deformity.

When seen in June, 1931, aged 2 years 3 months, the nystagmus had entirely ceased; there was then no evidence of active rickets.

CASE 3.—Male. Patient had been kept since birth in a back room of a basement flat, the mother's bed being between the cot and the window. Head-nodding commenced at the end of January, 1931, when the baby was 9 months old, and when he had not been taken out of doors for over five weeks on account of pneumonia. When seen in May, 1931, the baby was very pale, with severe rickets. The head was "nodded" antero-posteriorly when the child sat up, and the nodding was associated with rapid lateral nystagmus affecting both eyes equally. When the child's attention was attracted he looked at the object out of the corners of his eyes; the nystagmus did not appear to be lessened by this, but the head movements became definitely less marked. The mother had typical Hutchinsonian teeth (upper incisors) and defective eyesight, but refused a blood-test on herself or the baby. The latter, who was born of a first pregnancy, showed no stigmata of syphilis.

When seen two months later, after antirachitic treatment and change of dwelling, the baby appeared considerably improved, and both the head-nodding and nystagmus were very much less marked.

CASE 4.—Female. Youngest of seven children; all siblings well. Family lives in dark two-roomed basement flat, the parents' bed standing between the baby's cot and the window. The patient had been kept in the house almost continuously, owing to bad weather, for several weeks before the onset of symptoms. She was brought to hospital at the age of 3½ months on account of head-shaking and nystagmus, which had been noticed since the age of 2 months. (The onset of the symptoms occurred in January, 1931.) When first seen (March, 1931) she showed early rachitic deformities, with lateral head and eye movements, which were almost continuous when she was sitting up, but varied considerably in range; both eyes were equally affected. Vertical nystagmoid movements also occurred, but infrequently.

Patient was given open-air and antirachitic treatment, and at seven months (July, 1931) all evidence of the condition had disappeared.

COMMENT.

It is clear that each of these infants had been kept in a dim light for a considerable time before the onset of symptoms; this is the most outstanding feature in the four cases. Three of the children occupied basement rooms, and the fourth a top back room, dimly lit by a window facing an adjacent wall, and requiring artificial light in the daytime. The occurrence of the onset of head movements in two of the cases was somewhat later in the year than is usually described (January and February being the most usual months). It is doubtful, however, if either of these infants were taken out of the house at all frequently during March. In each case there was associated rickets, and recovery took place as the rickets improved. Caution must be observed, however, in attaching too much importance to antirachitic treatment in the cure of spasmus nutans, since it must be remembered that the condition is self-limited, and improvement would doubtless have taken place during this period in any case. As previously suggested, it is probable that increasing power of coördination was developed with increasing age.

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CONSECUTIVE AUTOPSIES OF UNUSUAL INTEREST.

BY IAN B. MORRIS, M.B. CAMB.,
CLINICAL PATHOLOGIST AT LAMBETH HOSPITAL.

THE aphorism that good things never come singly is nowhere seen to better advantage than in the post-mortem room. Pathological rarities are not uncommonly seen twice in one day, and then not again for years. A student watching post-mortems on one day only may think that the heart or the spleen are the commonest situations for secondary deposits of growth. Such days occur in the experience of every pathologist, and the following seven cases occurred in two consecutive days of post-mortem work in Lambeth Hospital recently. The total number of autopsies performed on these two days was 12, and the five cases which are not quoted here were all of such interest as would have enlightened a day devoted to myocardial degenerations and cerebral hæmorrhages, but shine with lesser brilliance among the galaxy here presented.

SPONTANEOUS RUPTURE OF AORTA.

CASE 1.—A male, aged 49, had been admitted to hospital complaining of a sudden severe pain in the left side of the chest and down the spine. The pain had started at mid-day, and as the day drew on he had nausea, but no vomiting, and became short of breath. He was admitted at 11 P.M. the same night; he was found to have dyspnœa on exertion. The apex-beat of the heart was just inside the nipple line. There was a harsh systolic and a diastolic (to-and-fro) murmur at the base. There was an apical systolic and a faint murmur between the second and first beats. The blood pressure was 97/60. There was a previous history of epilepsy for many years, and the Wassermann test was negative. The patient still had dyspnœa next day, and in the early hours of the following morning he died in his sleep.

Post-mortem examination revealed about a pint of blood in the pericardium and much extravasation of blood round the base of the aorta and the pulmonary artery. There was a transverse tear through the base of the aorta, on the posterior surface, about half an inch above the cusps of the valves. The tear was linear, and involved only the intimal and medial coats of the artery, and gave the impression of having been made by a knife. The adventitia had been stripped cleanly from the media by blood, as in a dissecting aneurysm. The blood had spread up and down between

the two outer coats. At the lower part of the artery was a small rupture through the adventitia and the pericardium, through which the blood had leaked into the pericardial cavity. Macroscopically the aorta appeared singularly free from disease, apart from a few patches of atheroma and a very mild degree of puckering.

Histological examination of the aorta at the site of the rupture showed atheromatous changes, and an attempt by the blood in one place to split the muscular coats. The coronary arteries were patent, and free from disease, and the aorta and mitral valves appeared healthy. The heart muscle was quite good, and the heart normal in size.

Sir Clifford Allbutt [1] says: "Rupture of an aortic aneurysm is common, but rupture of an aorta apparently sound or in a young person, if an infrequent, is not now a surprising event." He quotes several authenticated cases, some of which were syphilitic, while in others no proof of disease was found. He goes on to say that "an effort or wrench has often determined the moment of 'rift,' which may or may not penetrate all coats, but, checked by the outer ones, forms a dissecting aneurysm." Sir William Osler [2] makes similar observations about the condition, and mentions a case in which rupture occurred in a healthy boy of 14 after exertion. He says that rupture may occur in an apparently healthy vessel as a result of sudden strain, and sometimes without effort, and he also says that it usually takes the form of a dissecting aneurysm. He mentions that the symptoms occur in two stages: one corresponds to the rupture of the intima, with which is associated severe pain and collapse, from which the patient gradually recovers. Then, in the course of three or four days, external rupture occurs with sudden death. A case was described by J. A. Maclean and J. Fiddes,[3] which was very similar to ours, and F. T. Thorpe describes one in which the tear was longitudinal; histological examination in this case revealed degenerative changes.

It is interesting to mention a case which a reader reported to the *Field* of April 4th last. He noticed that on approaching a grey hen the bird did not take flight immediately, but ran for several yards along the ground. It then rose in the air and flew strongly. Suddenly it dropped to the ground, and was found to be dead. The bird was sent to the editor of the *Field*, and an autopsy revealed that death was due to "a rupture of one of the large vessels near the heart," causing an internal hæmorrhage. Autopsies on game and poultry birds not uncommonly show death to be due to a rupture of the heart or blood-vessels.

PULMONARY NEW GROWTH.

CASE 2.—A male, aged 42, had a history of four months' cough. The cough had improved after the removal of teeth. Three weeks before his admission to Lambeth Hospital he began to have shortness of breath and severe cough. There was scanty sputum, which two days before admission had been blood-stained, and he lost his voice. On admission he was wasted, and obviously very ill. There was board-like dullness at the left base, with absent tactile vocal fremitus. Temperature was 98·6°, and pulse-rate 120–128.

At *post-mortem examination* the left lung was found to be involved in an extensive growth, which occupied nearly the whole of the lower lobe. The mediastinum was extensively involved, and the growth spread downwards, through the pericardium into the left auricle. The pericardium was found to contain about half a pint of blood; on investigation it was seen that the pulmonary vein was involved and had been eroded by growth. This erosion had caused the hæmorrhage into the pericardium. There were no other secondary deposits. Histological examination showed the growth to be an "oat-celled" carcinoma arising in the bronchus.

This case and the preceding one are interesting examples of two of the rarer causes of hæmopericardium. In contrast to this one, which showed deposits in the heart due to direct spread of growth from the mediastinum, the next is an example of secondaries in the heart due to metastasis.

CASE 3.—A female, aged 52, was admitted to hospital with a diagnosis of pleural effusion, and a provisional diagnosis of new growth of lung.

Post-mortem examination showed a growth of the left lung which appeared to have arisen in the bronchus. The lung was extensively invaded, and the mediastinal glands slightly involved. The surfaces of the right auricle and ventricle were studded with small nodules of growth. The pericardium was not involved. There were also secondary deposits in the suprarenals and the right kidney. Histological examination showed an alveolar carcinoma of fairly large cylindrical cells with much metaplasia, and the growth proved to be a carcinoma, primary in the bronchus.

CARCINOMA OF THE STOMACH.

The next case is also an example of secondary growth in the heart muscle by metastasis, the primary being in the stomach.

CASE 4.—A male, aged 39, was admitted with a history of three years' indigestion and loss of weight. The liver was easily palpable, there were enlarged supraclavicular glands, and X ray showed gross deformity of the stomach.

Post-mortem examination revealed a large indurated ulcer on the posterior surface of the stomach, near the lesser curvature, and about one and a half inches from the pylorus. The ulcer gave the appearance of having been at one time a chronic simple ulcer which had become malignant. The liver was huge, and contained an enormous number of secondaries—so many, in fact, that there was hardly any normal tissue left. There were secondary deposits of growth dotted about the heart muscle, particularly the right ventricle. There were also deposits in the suprarenals and on the pelvic wall. Histological examination showed a carcinoma simplex.

The interest in this case lay rather in the appearance of the primary, which gave rise to such diverse and numerous secondary deposits. Had there been no other evidence of growth beyond the ulcer, which was under an inch in diameter, its malignancy would have been sufficiently in doubt to justify withholding an opinion as to its nature until histological examination had been made.

The next case is also one of a carcinoma of the stomach; its macroscopic nature, however, is almost diametrically opposite to the one just recorded.

CASE 5.—A female, aged 52, had a history of several months' vomiting after meals, but no pain. There was a left-sided pleural effusion, a palpable liver and spleen, and small masses were palpable in the abdomen.

Post-mortem examination showed a diffuse carcinoma involving the whole of the stomach wall, which was about half an inch thick. No one part of the wall appeared to be more involved than another. There was also extensive malignant peritonitis. At the upper pole of the left kidney there was what was thought to be a rather cystic secondary deposit, which was encapsulated.

Histological examination of the stomach showed an exceedingly diffuse carcinoma simplex invading all layers of its wall. The kidney "deposit" was a completely encapsulated hypernephroma showing the characteristic large clear cells. The double pathology here involved is striking.

The next case had several interesting features and the denouément which came in the post-mortem room was, to say the least, spectacular and unexpected.

IMPACTED GALL-STONE.

CASE 6.—A female, aged 65, gave a history of epigastric pain occurring two hours after meals, relieved by bismuth and by vomiting. It was intermittent in character. There was some loss of weight, and although the appetite was good the patient was afraid to eat. She also had bronchitis. The spleen was palpable, and also a smooth tumour in the epigastric region, which was considered to be gall-bladder. Rectal examination showed a ballooned rectum; no growth was felt. Tests for occult blood in the fæces were negative. There was no free acid in the resting juice, and the acid curve after a test meal was low. The day before her death the patient became jaundiced, and there was bile in the urine. The liver was easily palpable. Only twice was the temperature above normal, on two days shortly before death; on neither of these days did it rise above 99·6°. The pulse-rate gradually increased, and before death reached 120.

Post-mortem examination showed purulent bronchitis. The gall-bladder was distended and contained a few gall-stones. On opening the duodenum, the ampulla of Vater was found to be distended by a large gall-stone about the size of a date, the tip of which was protruding through the ampulla into the duodenum. It was firmly fixed in position. The liver was large, and on section showed areas of cholangitis. Histological examination of the liver showed marked polymorphonuclear infiltration around the biliary system, and in places there was almost abscess formation.

In view of the findings in the liver, it is interesting to notice the almost complete absence of fever.

The next case, and the last one to be described, is quite different from them all, and by no means the least interesting.

MILIARY TUBERCULOSIS.

CASE 7.—A male, aged 61, was admitted for persistent cough. The sputum, when examined for tubercle bacilli, was negative. The chest moved poorly. There was prolongation of expiration all over, and high-pitched breathing. There was a patch of bronchial breathing at the right apex. X ray of the chest showed increased shadows at the hilum of both lungs.

Post-mortem examination showed extensive miliary tuberculosis of the lungs. The pericardium was completely adherent to the heart wall all over, and it and the heart muscle contained yellowish areas, particularly on the posterior surface, which more than anything else resembled early pyæmic abscesses. The mediastinal glands were slightly enlarged. The liver showed small tubercles, and the kidneys also contained yellow areas, which in places were caseating. Histologically the liver and lungs showed typical anatomical tubercles. The heart and kidneys showed necrotic areas of caseation surrounded by endothelial cells and small round cells. There were, however, no giant cells. Staining these tissues by Ziel-Nielson's method, both were seen to contain large numbers of tubercle bacilli. The bacilli were not demonstrated in the liver, although the microscopical section was quite typically tuberculous.

As a result of these discoveries in two days in the post-mortem room, the museum in the pathological department at Lambeth Hospital has been considerably enriched.

My thanks are due to Dr. D. S. Murray, pathologist at Lambeth Hospital, for his opinion on these cases, and to Dr. G. F. Stebbing and my other colleagues at Lambeth Hospital for permission to publish them.

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CLINICAL AND LABORATORY NOTES

HYPERTENSION IN A YOUNG SUBJECT.

BY S. D. ISAACS, M.B. CAMB., D.P.M.,

TEMPORARY ASSISTANT MEDICAL OFFICER, RUBERY HILL MENTAL HOSPITAL, BIRMINGHAM.

A LEADING article on Hypertension as a Symptom in THE LANCET of August 15th prompts me to record the details of the following case.

A single man, aged 31, a telephone fitter, first attended the psychiatric out-patient clinic at the Queen's Hospital, Birmingham, on June 2nd, and was admitted as a voluntary in-patient to the Rubery Hill Mental Hospital on July 7th.

HISTORY.

Family History.—The maternal grandmother died at the age of 70 after about 30 years in a mental hospital. No details of her illness are available. No other psychotic nor neurotic traits nor other symptoms suggesting hypertension were described in the near relatives. The father (62), mother (63), and three sisters (27, 30, and 33) are all well.

Previous Personal History.—Measles at age of 3. Nocturnal enuresis from babyhood until about 1928. From 1916 to 1918 he had palpitation and was said to have a goitre. In 1928, apparently about the time his nocturnal enuresis ceased, he began to have painless frequency of micturition about three times every night, which lasted for 15 months. About eight times during the past five years he had had dull frontal and parietal pain on rising in the morning, lasting about one hour. No other physical illnesses were recalled.

He had for many years past felt himself inferior to others on account of his height (6 ft. ½ in.), and had considered himself below average in intelligence. He had always felt his sisters tried to exercise undue authority over him. For years he had worried over the possible mental and physical ill-effects of masturbation, while continuing to practise it. He was very shy about heterosexual matters, had made very few male and no girl friends, and had played no games.

On leaving school in the top standard at the age of 14 he had taken work as a telephone fitter. He had been very interested in this and had made good progress but had worried unduly over details. He had lost this post in 1920 owing to shortage of work and until 1927 had done similar casual work. His consumption of alcohol and tobacco had been very moderate.

Present History.—For the past four years he had suffered with increasing depression, which he attributed to lack of employment during this period. During this time he had lived at home with his parents and a sister. He had quarrelled repeatedly with the sister, in his father's opinion without any provocation on her part. Had thought of suicide by jumping under a train but said he had not the courage, since, as a Roman Catholic, he feared eternal damnation. He thought he had committed a sin by immoral thoughts and by not feeling sincere enough at confession. His general attitude was one of moderate depression and anxiety.

On the day of admission to the mental hospital there was some slight evidence of auditory hallucinations.

PHYSICAL EXAMINATION.

He was a thin and sallow man. The blood pressure was 238 mm. Hg systolic and 138 diastolic in the recumbent position. There was moderate radial arterial thickening and a poor peripheral circulation. The aortic second sound was accentuated and radiography showed slight hypertrophy of the left ventricle with very slight thickening of the aorta and a prominent aortic bulge but no aneurysm. There was no evidence of arterial calcification on radiography of an upper limb. Œdema was absent. The urine contained an excess of oxalates and a few red cells but was otherwise normal, urea being well concentrated. The blood-urea was 32 mg. per cent. The Wassermann reaction in the blood was negative. Oral sepsis was marked. The fæces contained Friedländer bacillus.

The aural surgeon reported excess of mucus in the posterior nasal spaces, horizontal spurs on both sides of the nasal septum, injection of the right nasal mucous membrane, and granular pharyngitis. The antra of Highmore and frontal sinuses were slightly dim. The tonsils were normal. The ophthalmologist reported a blurring of the upper margin of the right disc (possibly physiological). The fundal arteries were normal.

TREATMENT.

During his stay in hospital his attitude to his difficulties was discussed with him, with the explanation of simple mental mechanisms, such as the escape reaction. After a fortnight in bed he was encouraged to help with light ward-work and became very sociable. He had had three septic teeth extracted at the Queen's Hospital as an out-patient and his remaining teeth, all septic, were removed on July 17th. His blood

pressure on July 21st was 224/150 mm. Hg. On the 23rd it was 232/144. On the 29th both antra and ethmoidal sinuses were washed out by the Watson-Williams technique. No exudate was found and bacteriological examination was negative. The walls of the sphenoidal sinuses were too dense to enter. Repeated colon irrigations showed muco-pus, at first in dense masses and finally in moderate amounts only. On August 11th he was discharged at his own request. He was still thin and sallow. His blood pressure on that date was 240/150 mm. Hg. There was some anxiety and the feelings of inferiority persisted. There was, however, very little depression. He looked forward to returning home and getting outdoor work.

This seems to be a true case of essential hypertension. Treatment was not followed by nor was the improvement in the mental state associated with any alteration in the hypertension.

My thanks are due to the visiting staff for their assistance and to my medical superintendent, Dr. T. C. Graves, for kind permission to publish this case.

SUDDEN DEATH FROM INTERSTITIAL CARDIAC HÆMORRHAGE.

BY FREWEN MOOR, *M.C.*, M.D. CAMB.,
PHYSICIAN TO MARGATE AND DISTRICT GENERAL HOSPITAL.

ON Dec. 28th, 1929, a lodging-house keeper aged 68, single, complained of pain in the right chest, due apparently to bruising of the chest wall; further examination showed that the heart was hypertrophied, the apex being 4½ in. from the mid-line. The pulse-rate was 92 regular, and the blood pressure 184/110. The apical first sound was booming and the aortic second accentuated; there were no murmurs. The arteries were palpable but not tortuous; there was no œdema.

On questioning, she admitted that she got "chest ache" on walking, and seldom went out on that account. However, she went on with her usual work, which in the summer involved seven strenuous days a week starting at 5.30 A.M. I saw her in the middle of August of this year, when visiting another patient in her house, and she told me she was rather tired and intended to consult me when the season was over.

On August 28th she got up at 5.30 A.M. as usual, and remarked to her maid that she felt very fit; she did her usual work and at 7.50 A.M. came into the kitchen and sat down; the maid asked if she had chest ache again, but she replied "No, I am all right," whereupon her head fell back and she expired; there was no convulsion.

Post mortem the heart was somewhat hypertrophied and the left ventricle dilated; valves normal. There were no atheromatous plaques in the aorta, and the orifices of the coronary arteries were open; the proximal 1½ in. of each coronary was calcareous and greatly stenosed, so that it was not possible to pass a probe, but no thrombus could be seen. On opening the auricles an area nearly ½ in. in diameter on the lower part of the interauricular septum on the right side was slightly discoloured, and on incising the endocardium an ecchymosis was discovered which had stripped up the endocardium for a short distance.

There were plaques of atheroma on the cerebral vessels, but no hæmorrhage into the brain. The kidneys and other organs appeared healthy.

For sudden death to occur in a person enjoying good health, one would expect a small vascular lesion in a vital centre—small because there would not be time for it to get large, and vascular because of its suddenness; or there might be a sudden failure of physiological function, such as ventricular fibrillation (in which case there would be no specific morbid anatomy although the condition has been seen in the post-mortem room). The vital centre in the brain is the medulla and pons, and hæmorrhage in this situation causes sudden death; in the heart the vital centres are the coronary arteries and the conducting tissues. In the present case death was apparently due to hæmorrhage into the auriculo-ventricular node, causing sudden and complete heart-block, from which the ventricles failed to recover. One might have expected convulsions, as in the Adams-Stokes syndrome, but they were not observed.

ILEOCOLIC INTUSSUSCEPTION PROLAPSING THROUGH THE ANUS.

BY PATRICK K. DIXON, M.D. DUB.,
OF THE GARANGANZE EVANGELICAL MISSION, CHIBAMBO, ELISABETHVILLE, BELGIAN CONGO.

ON March 17th a native was brought to hospital with a mass of intestine appearing at the anus. It is exceedingly difficult to get an accurate history from natives but it seems that the prolapse had been evident for at least 24 hours before admission, if not for 48 hours, and that he had had abdominal trouble for about a week. The prolapsed mass was very œdematous and the mucous membrane was gangrenous in parts. No opening could be made out on its summit. Spinal anæsthesia was induced and the œdema squeezed from the mass. It was replaced into the rectum where it could be felt to hang more or less freely. Pelvi-rectal intussusception accordingly was diagnosed and the abdomen opened by a left paramedian incision. A little free fluid was found but no obvious intussusception. The lower part of the sigmoid colon was thickened and felt boggy, while the upper part and the descending colon appeared to be drawn tight and felt hard. It was then assumed that a very large polypus of the rectum had prolapsed and had drawn down with it a large amount of hypertrophied mucous membrane. (The colons of some of these people are frightfully damaged by old dysentery and such a condition of affairs is not inconceivable.) Weight was lent to this opinion by the fact that a stomach-tube (the only rubber tube available) could be passed up beside the lump as far as the splenic flexure. Aided by the fingers of an assistant introduced into the rectum a large part of the prolapsed material was "milked" back and the tension on the upper part of the colon largely lessened. The patient's pulse was quite fair after the operation.

The patient made a normal recovery from the operation. There was no pain or distension. He was fed on the ordinary invalid food which is thin porridge. He had incontinence of fæces, but the motions appeared fairly normal. They contained a good deal of mucus and some sloughs of mucous membrane.

The patient's general condition did not improve, but there was no marked disimprovement. On March 30th, a surgical colleague having arrived, it was decided to excise the "polypus." Spinal anæsthesia was again induced. On pulling down the "polypus" an opening was now plainly evident on its summit and my colleague, not unnaturally, doubted my denial of pelvi-rectal intussusception. It was obvious

that the caput of the intussusceptum had to be excised. On cutting through the outer layer of bowel the first thing that appeared was the vermiform appendix. The operation was completed by suturing the inner layer of the bowel to the outer and simply replacing it in the rectum, but the shock of this further operation was too great for the patient and he died 12 hours later. It was not possible to obtain a post-mortem.

In this case an ileo-colic intussusception lay in the rectum for at least 14 days without causing either gangrene or obstruction. Further, although the mesenteric nerves must have been pulled on, there was no marked shock.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING IN EASTBOURNE.

SECTION OF OBSTETRICS AND GYNÆCOLOGY.

AT the final meeting of this section, the President, MR. EARDLEY HOLLAND, in the chair, a discussion on

Endometrioma

was opened by Prof. DONALD DOUGAL (Manchester), who pointed out that it was ten years since Sampson first described the condition and presented a general survey of information gained from his personal series of 137 cases. Endometriosis he defined as the pathological state whereby fragments of endometrium leave their proper site in the uterus and develop elsewhere. Endometrioma was the name used for the growth which formed when the tubular glands surrounded by a cellular stroma began to grow in a foreign tissue. The characteristic and essential feature of these tumours was the bleeding into their substance which took place with each menstrual period. A series of lantern slides of photomicrographs were shown comparing the histological appearance of an endometrioma with that of normal endometrium in the different stages of the menstrual cycle.

In 1908, Prof. Dougal said, Cullen studied diffuse endometrioma, or adenomyoma, of the uterine wall and formulated his diverticular theory, but this theory could not explain all cases. In 1921 Sampson flood-lighted the subject by showing that retrograde menstruation through the Fallopian tubes could cause fragments of endometrium to be scattered over the pelvic cavity. The ovary and the recto-vaginal space offered the best site for growth of the implants. The ovary had no peritoneal covering, and the raw area left by a rupturing Graafian follicle readily permitted engrafting of endometrial tissue. The ovary acted as a "hot-bed" for the graft, and the largest endometrial tumours and tarry cysts were met with in the ovary. The irritating menstrual blood caused an inflammatory reaction, and these cysts became surrounded by dense fibrous tissue. Removal without rupture from an ovary was impossible. The endometrial tissue ran in seams through the ovarian substance, and rendered total removal of the ovary necessary. The cyst sometimes ruptured spontaneously and caused a further cellular spill over the pelvic peritoneum.

A series of slides was shown representing the various naked-eye and microscopical appearances encountered. Special mention was made of the multiple purple patches and puckered areas sometimes seen on the peritoneum. Prof. Dougal distinguished a type which invades the recto-vaginal septum, and which may form purple polypi in the posterior vaginal fornix, and another which may involve the wall of the rectum and transform it into a mass of fibrous tissue, fixing it to the posterior wall of the uterus. Such growths were often mistaken for carcinomata of the rectum. He classified his 137 cases as follows:—

	Cases.
Diffuse endometrioma of uterine wall	9
Cornual endometrioma	6
Ovarian endometrioma	44
Recto-vaginal septum endometrioma	44
Ovary and recto-vaginal septum endometrioma	34

Fibroids were present in 40 per cent. of his cases, and were of clinical importance in 27 per cent. Of all fibroid cases, 10 per cent. were associated with endometriomata. The fibroid possibly increased the likelihood of retrograde menstruation, especially in single women. Infection had no influence in causing an endometrioma to develop. The condition appeared during menstrual life; 90 per cent. of cases were between 30 and 50 years of age. It was much commoner in married women. In his experience 11 per cent. of all laparotomies were done for endometrioma. The symptoms were those of abdominal pain (in 40 per cent. of cases), and increasing dysmenorrhœa or epimenorrhœa (in 31 per cent.). Dyspareunia was a frequent complaint, and might be very severe. Rectal symptoms were sometimes present, and occasionally a patient complained of shooting or "electric" pains in the leg. Sterility was frequent; 75 per cent. of his cases had no child for five years preceding the operation. On examination the uterus was often found to be enlarged and less mobile than usual. Sometimes it was retroverted and firmly adherent to a mass in the pouch of Douglas. Nodules were sometimes felt in the posterior vaginal fornix. The treatment was complete removal of uterus and all ovarian tissue. It was dangerous to leave an ovary behind in any but a very early case, and even then recurrence often took place. Operation might be of extreme difficulty because of the adhesions and infiltrating nature of the growth, but end-results were very satisfactory. Total hysterectomy gave better results than subtotal.

DISCUSSION.

Dr. R. M. MANWARING-WHITE (Northwich) gave details of a case of extreme dysmenorrhœa where, at operation, a large mass was found fixed to rectum and uterus. The patient continued to have some dysmenorrhœa after the operation, but this disappeared after treatment with deep X rays.

Dr. MALCOLM DONALDSON (London) quoted a case of endometrioma of the recto-vaginal septum successfully treated by radium.

The PRESIDENT also spoke of the value of radiation treatment, and described a case where the use of intra-uterine radium had been followed by almost miraculous results.

Mr. FRANK COOK (London) asked how an endometrioma of the umbilicus could arise on the cellular spill theory.

In reply, Prof. DOUGAL said that he had no experience of radiation therapy. The treatment was always radical; the ovary could be removed by surgery, or destroyed in situ by radiation. An endometrioma of the umbilicus might possibly arise from a fragment of endometrial tissue being carried upon the fundus of the bladder.

The Pelvic Brim.

Dr. KATHLEEN VAUGHAN read a paper on the shape of the pelvic brim as a determining factor in childbirth. She showed tracings of the inlet of the pelvis reproduced from specimens in the R.C.S. museum. She emphasised the great variety in shape,

especially in women of different races. For a given circumference the shape of the brim was of utmost importance. The suboccipito-frontal diameter of the child's head was round, and a round pelvis could therefore allow a larger head to pass than one of any other shape. The shape of the pelvis depended on the habits and customs of the woman. The sacro-iliac joints should be well formed and freely movable. This was found in women of native races who were accustomed to the squatting position. Specimens illustrating this point were shown, including an innominate bone found during excavations at Ur of the Chaldees. Women in this country who did heavy manual work, such as fisherwomen and gypsies, had easy labours, while women in industrial towns had difficult labours. Negro women usually had easy labours, but in New York they had more difficulty than the white women during parturition. Prolonged labour was most often due to the pelvic brim being other than circular in outline. The slight flattening usually present was pathological and due to minor degrees of rickets, and making young girls sit long hours on benches in school.

Dr. JANET M. GRAY (London) spoke of the appalling obstetric conditions found in India. Among the high-caste Brahmin women of the United Provinces Cæsarean section was often necessary, while in the Marathi district, where similar women were allowed more freedom, this was almost unheard of.

Prof. DOUGAL pointed out that among native women there was often probably a greater concentration of pressor substances in the blood, and this was another factor in determining the ease of labour. Prof. Blair Bell had suggested that primary inertia, secondary inertia, and tonic contraction of the uterus could all be explained on these lines.

In reply, Dr. VAUGHAN emphasised the harmful influence of civilised life and habits on the shape of the pelvis. An extreme example was the weaver caste in Bombay. The wives were kept in seclusion in dark rooms, and quickly developed osteomalacia. If it were not for the constant coming in of new women from the country the race would quickly die out. In this country insufficient thought was given to the development of the child before puberty.

Shock following Accidental Hæmorrhage.

Dr. O'DONEL BROWNE (Dublin) read a paper on shock following blood extravasations with special reference to the treatment of accidental hæmorrhage. It was stated that shock could follow blood extravasation, but this, he said, occurred only in special instances, and depended largely on the rate of reabsorption. A toxic substance probably formed in the clotted blood. The first warning of the onset of shock was a fall in blood pressure, and when this pressure fell to a low level renal and general disorders occurred. A persistently falling blood pressure in spite of treatment by means of salines, morphia, pituitrin, and ephedrine, was of very serious import, and efforts should be made to localise and remove the effusion as soon as possible. Prophylactic treatment by salines, morphine, and ephedrine was of the utmost importance. By its use as a routine procedure cases might be rendered operable which otherwise would be killed by interference. In event of labour not starting after the above treatment puncture of the membranes, administration of pituitrin, and plugging of the vagina should be performed without delay, provided that the blood pressure was not below 80 mm. Hg. Below this level, unless marked rise of pressure was soon noticed, Cæsarean section should be performed. Dr. Browne insisted that the patient's condition and the degree of shock could be best estimated by the routine observation of blood pressure.

The paper was discussed by the PRESIDENT, Dr. DONALDSON, and Dr. ETHEL TOWNEND (Hull), who dealt with the pathology of shock.

In reply, Dr. BROWNE pointed out that his work was done entirely from the clinical standpoint. In answer to a question he said that the improvement, seen in cases of accidental hæmorrhage after a fœtal leg had been brought down, was due to the escape of blood imprisoned in the uterus, and also to the compression of the placental site. Many cases of so-called accidental hæmorrhage were, he added, in reality mild undiagnosed cases of placenta prævia.

SECTION OF ANÆSTHETICS.

AT the second meeting of this section, the chair being taken by Dr. S. T. ROWLING (Leeds), a discussion on

Carbon Dioxide After Anæsthesia

was opened by Dr. J. ROSS MACKENZIE (Aberdeen), who based his remarks on 5000 cases. The advantages of this gas, he said, were its prophylactic and curative action in post-anæsthetic respiratory complications, no matter what anæsthetic was used, and the protection it afforded to patients with existing respiratory disability. He had given his recent cases carbon dioxide during induction and during recovery for periods of five minutes at four to six-hourly intervals for 24 to 36 hours. The nuclei of origin of the vagus were profoundly disturbed by afferent stimuli from the anæsthetic or operation, owing to their proximity to the respiratory centre, and acapnia in every degree resulted. Acapnia brought the lungs to rest in deflation; hyperventilation with carbon dioxide kept them in continuous inspiration, and stimulated the activity of the cilia, bronchial peristalsis, pulmonary drainage, and the expulsion of exudates. Serious respiratory sequelæ were very rare if hyperventilation were maintained for 24 hours after operation. As a curative agent carbon dioxide was slightly less powerful, and administration must be commenced on the earliest evidence of respiratory sequelæ. It would not prevent cough, pain, and temperature if catarrh and pathogenic organisms were already present, but it would minimise the risk. It relieved the pain felt in abdominal wounds on deep breathing. The only effect of two hours' inhalation of 6 per cent. carbon dioxide was diuresis and increased acidity of the urine.

The CHAIRMAN remarked that the prolonged administration of carbon dioxide in nursing homes introduced several practical difficulties. It was necessary to instruct nurses in the use of the apparatus, the weight of which was a severe drawback to its popularity.

Dr. F. T. EVANS (London) recommended carbon dioxide in the treatment of refractory hiccough, quoting an illustrative case. He asked if any harm were likely to arise from its prolonged administration.

Dr. R. J. CLAUSEN (London) pleaded for simplicity of apparatus. The "Carbetha" (Siebe, Gorman and Co.) automatic apparatus, he thought, was the best, but the engineering side lagged behind the technical side.

Dr. MACKENZIE in reply stated that prolonged administration did no harm at all, because the respiration was increased to maintain a definite percentage of the acid in the blood.

Premedication.

Dr. E. S. ROWBOTHAM (London) defined premedication, or basal narcosis, as a method of rendering the patient unconscious in bed before the administration

of the anæsthetic and said that it was no longer necessary for a patient to witness the preparations for his operation, to inhale until the last threads of his dissociating consciousness finally broke, and to awake, reeking of anæsthetic, to hours of vomiting. Insufficient recognition had been given to Gwathmey for recognising the importance of abolishing pre-operative fear. Since his rectal oil ether method, paraldehyde, avertin, and the barbiturates had been introduced. Paraldehyde would only produce unconsciousness in young children and very old and debilitated subjects; morphine or some other drug must be added. After discussing the dosage, he went on to say that with avertin excitement was rare, and the patient quickly went to sleep in a natural manner, but narcosis progressively deepened for another 10 or 15 minutes. It was quieter and deeper than that of paraldehyde and the patient was relaxed. Contra-indications were few and restlessness and vomiting rare.

The barbiturates were essentially hypnotic drugs. The more toxic the compound, the smaller the dose required and the quicker the effect produced, the shorter the period during which it acted, and the more rapid the elimination from the system. The blood pressure was usually lowered 20 to 30 points after intravenous administration, but often returned to normal within 10 minutes. Preliminary morphine increased the action and also the fall of blood pressure. The barbiturates were probably eliminated by the kidneys after having been broken up by the liver. Thyroxin and caffein were said to hasten the elimination. The three compounds recently employed were: sodium amytal (sodium-iso-amyl-ethyl-barbiturate), nembutal (sodium-ethyl-methyl-butyl-barbiturate), and pernocton (sodium salt of secondary butyl-β-brom-allyl-barbituric acid). They all acted quickly and were very toxic, but sodium amytal was only half as powerful as the others. Nembutal was most pleasant to the patient. Wherever possible the drugs should be given intravenously, as their action intramuscularly, per os or per rectum was delayed. Correct dosage was ensured by running the solution into the vein very slowly (1 c.cm. per minute) while talking to the patient; the administration was stopped directly he lost consciousness. Usually very little anæsthetic was needed and vomiting was practically unknown. Recovery, which took place in from two to six hours, was followed by a long period of drowsiness which might last up to 24 hours.

Dr. Rowbotham preferred paraldehyde for children and nembutal for adults, and regarded them both as eminently safe in expert hands. Combinations of drugs acted more powerfully than single drugs and elimination was easier and quicker. A little morphine, just enough nembutal to induce sleep, and then nitrous oxide and oxygen or ethylene, with a minimum of ether if necessary, gave the patient most protection, least injury, and easy awakening. The administration needed experience, and it would be a great pity if reproach were brought upon basal narcosis by the inexpert.

DISCUSSION.

Dr. HUGH R. PHILLIPS (London) stressed the importance of giving morphia or omnopon, with or without atropine or hyoscine, whenever one of the barbiturates was used. It could be safely administered to any patient over the age of 3, in proportionate doses. In children it was contra-indicated if there was acidosis, kidney disease, sepsis, or shock. Adults should receive a narcotic on the evening before the operation. The best premedication for children was paraldehyde, in solution and not in oil; small doses produced excitement and therefore a full dose should be given. His results with avertin had been satisfactory. Vomiting after nembutal was rare, but a considerable number of patients became excited and even violent. This drug had given satisfactory results with spinal anæsthesia. He thought premedication somewhat overdone nowadays, and quoted good results obtained without it. Nevertheless, it was valuable for nervous patients and those who had to go through a series of operations; for those who should perform voluntary movements on the same day; for feeble patients who must take food early; and for those whose lungs were easily affected. On the other hand, more work was thrown on the nursing staff, for a patient who had been premedicated could not safely be left until he had recovered his reflexes, as the tongue was always liable to slip back.

Dr. I. W. MAGILL (London) said that basal narcosis was the latest development in anæsthesia and that the anæsthetist had to meet an increasing public demand for it. The surgeon, the general practitioner, the nurses, and the patient's friends should be instructed in the after-effects to save alarm and mistake. He preferred the intravenous route, because the dose was easier to gauge accurately. To children he gave paraldehyde, as the barbituric drugs were variable in their action.

Dr. RONALD JARMAN (London) stated that the aim of the anæsthetist was to get rid of the patient's fear of being put to sleep in cold blood. Basal narcosis saved nervous shock and enabled the dose of ether to be reduced or even dispensed with; it would diminish the number of chest cases, do away with vomiting, and reduce shock to a minimum. The smell of paraldehyde had caused complaint and the solution had sometimes been expelled. The method was ideal for a child in a nursing home but unsuitable for a private house. Avertin was, he thought, an ideal anæsthetic and nearly 100 per cent. certain, its only disadvantage being that the patient was slightly restless when induced with gas-oxygen and ether. He had found that somnifane caused severe restlessness, and headaches for the rest of the day. Nembutal was excreted much more quickly than sodium amytal, but its action by the mouth was uncertain and patients were apt to be unruly. Premedication required much experience and vigilance.

Dr. EVANS maintained that the patient feared suffocation more than unconsciousness and vomiting. Avertin, and to a certain extent nembutal, were the ideal premedication for children. It was possible, with knowledge and experience, to run in more avertin if the original dose was insufficient, but he did not recommend this. Morphine and nembutal were apt to make the patient drowsy but aware of what was being done; under avertin and gr. $\frac{1}{6}$ morphine the patient slept. Avertin materially reduced vomiting and abolished chest complications. He never gave a spinal anæsthetic if the blood pressure fell 20 mm. after avertin.

Dr. F. B. PARSONS (Cambridge) recalled the fact that avertin had been invented as an antispasmodic for whooping-cough; it was a homologue of the trichlorethyl alcohol that was formed in the blood by chloral, and was slightly more potent. He pleaded for examination of the liver after any avertin deaths, which only occurred if morphine had been given. The solution in aniline hydrate caused less disturbance than the crystalline substance.

Dr. PUGIN MELDON (Dublin) warmly praised nembutal, which he said had proved harmless in doses of grs. xxvii. and grs. xxx.

Dr. CLAUSEN deprecated forgetfulness of the homely remedies, morphine and hyoscine, which removed apprehension.

Dr. ROWBOTHAM in reply remarked that a diastolic drop after avertin from 90–70 mm. was more serious than a systolic drop from 120–100 mm. A chloretone suppository would help retention in children.

Properties of Amytal.

Dr. R. C. GARRY (Glasgow) read a paper on the pharmacological properties of iso-amyl-ethyl-barbituric acid, which was, he said, widely used as an anæsthetic for experimental animals. For man the dose was 20–25 mg. per kilo of body-weight, intravenous, for complete surgical anæsthesia, and 12–20 mg. would replace 75 per cent. of the volatile or gaseous anæsthetic. It produced post-anæsthetic sleep and drowsiness for 12–72 hours, and therefore increased the necessary nursing attention. There was no post-operative distress. Early workers had claimed that amytal did not affect carbohydrate metabolism, but in fact intravenous glucose was not removed from the blood by the usual route, presumably because of inhibition of the storage of glycogen in the liver. Nevertheless, according to the consensus of opinion, amytal disturbed this function less than the majority of anæsthetics in general use, a fact which might be important when liver damage was feared. It lowered the body temperature and often produced shivering. It did not greatly diminish the minute volume of respiration, and the respiratory centre remained sensitive to carbon dioxide. It had a definitely toxic action on the heart, the more marked the more rapid the administration; the blood pressure fell rapidly and took an an hour or more to recover. Rapid administration was therefore dangerous. In animals the bulbo-spinal reflexes were little affected, and in the cat the inhibitory action of the vagus on the heart was abolished for several hours. This effect was not comparable to that of atropine, because amytal did not inhibit the action of acetyl codein; it might be significant in the use of volatile anæsthetics. The true sympathetic system was unaffected by amytal. Intestinal motility was definitely decreased, and the pylorus was tightly closed, perhaps because of an action on the parasympathetic system. Absorption of glucose, even from the duodenum, was greatly delayed. Amytal did not affect the guinea-pig uterus, and had been employed successfully in obstetrics. It inhibited water diuresis but did no apparent harm to the kidneys.

Clinical Administration.

Dr. H. P. FAIRLIE having taken the chair, Dr. ROWLING spoke on the clinical aspect. The anæsthetist, he said, owed to the patient the duty of anæsthetising him without delay, discomfort, or chill; and to the surgeon the duty of minimising the mechanical difficulties of the operation: the patient must be completely flaccid and have the smallest possible respiratory excursion. The quiet surgeon was as essential a result as the quiet patient. Anæsthesia should be as precise a science as surgery, and the anæsthetic should be definitely prescribed and dispensed, the ingredients being combined in exact dosage. The ordinary ingredients were nitrous oxide, ether, chloroform, oxygen, and carbon dioxide; and the physiological strengths required for anæsthesia were nitrous oxide up to 100 per cent., ether up to 24 per cent., and chloroform up to 3·5 per cent. The maintenance of anæsthesia required much less strength—about one-third—than its induction. It was required to construct an "anæsthetic atmosphere" that would meet the needs of the patient and of the surgeon, and the anæsthetist should be able to write precisely at any moment the prescription for the atmosphere the patient was inhaling.

Ether was safe on the table and dangerous afterwards; chloroform was dangerous on the table but caused no pulmonary complications. Gas, with or without oxygen, was safe, and carbon dioxide was essential for the control of respiration. The first cause of death during administration was ventricular fibrillation; this occurred only under light chloroform. The second and greatest was a cumulative overdose into the tissues from failure to reduce the dose when the patient was under. To prevent chest complications Dr. Rowling advocated induction by chloroform, given from a special vaporiser. Four drachms of chloroform were added to 12 ounces of liquid paraffin—a 4 per cent. solution; the strength of the vapour was between 2·5 and 3 per cent. The specific gravity should be maintained at 0·93. The patient lost consciousness without any choking, because he was receiving oxygen and carbon dioxide in excess and the delicate respiratory tract was anæsthetised before the irritating ether was given. Flaccidity was equal to that obtained by spinal anæsthesia, and respiratory excursion hardly greater. Oxygen in large excess combined with ether and about 3 per cent. of carbon dioxide gave a degree of anæsthesia that had hitherto not been considered safe. Resuscitation was effected by changing the atmosphere to carbon dioxide.

Dr. Rowling exhibited his chloroform vaporiser and his mask fitted with graduated inlets.

SECTION OF NEUROLOGY AND PSYCHOLOGICAL MEDICINE.

THE second session of this section, with Sir JAMES PURVES-STEWART, the President, in the chair, was devoted to a discussion on

Suicide.

Sir HUBERT BOND said he had long been impressed by the almost complete failure to realise the existence of medical problems in every case of suicide, coupled with the fact that most of these problems required for their right handling an adequate knowledge of mental disorders. It was a great mistake to treat an individual case entirely on socio-legal lines and ignore or mishandle the medical or psychological aspect. He would protest against the practice frequently made of putting questions, at inquests or in magisterial proceedings, as to the existence of insanity or of instances of suicide in other members of the family. Apart from the legal aspect of such evidence being admissible and however valuable medically such information might be, thus to catechise persons as to insanity or suicide in their family was surely to seek it in the wrong manner and in the wrong place. The practice spread ill-founded, possibly false, doctrines as to the influence of heredity in the causation of suicide and mental disorder; it often caused deep pain and distress. Some cases of suicide were indeed caused by ruminating on this very point. It was a fact that throughout the whole of his collection of records of suicides and attempted suicide there was not a single instance of evidence of enlightened inquiry as to what steps were taken by the relatives to prevent the occurrence by securing adequate treatment, nor in the case of attempts was there a single instance reported of insistence on adequate medical treatment. Under the Mental Treatment Act there was complete opportunity to organise thoroughly effective treatment.

In works on psychiatry, comparatively brief notice only was taken of suicide; the subject was in need of renewed and further study from a symptomatological and psychological standpoint. Such study should include careful inquiry, with the aid of trained social workers, into the environment, circumstances, and personal history of the series of consecutive cases. There was a popular idea that suicides had of recent years been increasing at a disturbing rate, especially among young people; careful examination of statistics, however, did not bear out this contention. Statistics regarding suicide could perhaps be said to date from 1750 as to Sweden and 1783 as to Switzerland and Paris. Most of those subsequently published, few of which were earlier than the second quarter of the nineteenth century, were collected under the well-known book of Morselin of Turin which might be said to include all available data up to 1876. For subsequent information upon the subject, especially as regards this country, various books, papers, and articles were available. Facts as to sex- and age-incidence, mode of death, &c., were confirmed by Sir Hubert Bond's own statistics, which comprised the number of suicides which occurred in England and Wales during each of the four census years, 1891, 1901, 1911, and 1921. For these four years the ratios of suicides per 10,000 population were 1·3, 1·5, 1·5, and 1·5 for males and 0·4, 0·5, 0·5, and 0·5 for females, and for both sexes together 0·9, 1·0, 1·0, and 1·0. The sex proportion, therefore, was almost exactly 3 to 1

PSYCHOPATHOLOGY.

Dr. H. CRICHTON-MILLER said that no discussion of the subject could go very far without considering motivation. Statistics gave only the conditioning factors. Suicide was a failure of adaptation and constituted a final regression from reality. The motives underlying suicidal acts were numerous and complex; it was impossible to ascertain them with any degree of certainty unless we were intimately acquainted with the patient's psychic life. It was convenient to group the motives under three headings: (1) physical pain, including frustration of instinctive demands; (2) social sufferings and fears; (3) doubts and dreads pertaining to the hereafter. As regards the first group, acute pain did not seen to impel suicide as frequently as some of the gross discomforts. Still more noteworthy was the fact that men committed suicide more frequently on account of anticipated pain than actual suffering, however acute. Civilised man appeared more capable of adjusting to physical pain than to anticipatory dread of it. The fear of insanity also deserved to rank among the major causes of suicide. In the prepsychotic stage a person might pass through a phase of suicidal tendencies, yet when the psychosis declared itself in a delusional manifestation the suicidal impulse might disappear completely. As regards "frustration of instinctive demands," it was probably true that more suicides had been occasioned by thirst than by hunger. In normal civilised life, however, it was the sex instinct which met with most frequent frustration and which in consequence accounted for the largest number of suicides in this group. Both men and women committed suicide on account of homosexuality, but in these cases the issue was almost always confused and could rarely be classed as mere instinct frustration. Conflict over homosexual tendencies, fear of social discovery, repressed inferiority —these and similar factors came into the ætiology. Many suicides were attributed to insomnia. The high degree of respectability which belonged to this complaint made it an eminently suitable explanation for mourning relatives, coroners, and journalists. It was, however, a very unsatisfactory explanation for the psychopathologist. In the second group—social sufferings and fears—the motivation was usually simpler and less liable to misinterpretation. Suicide on account of bankruptcy, loss of employment, legal proceedings, &c., all revealed the extent to which herd values might eclipse the instinctive desire to live. Doubts and fears regarding the hereafter tended to have an inhibitory effect but that effect waned as dogmatic religion embodying a system of eternal rewards and penalties lost its hold on the community. There were also many other important aspects of the subject with which time did not allow the speaker to deal—viz., the frankly psychotic suicides—especially the melancholics and cyclothymics —which were primarily problems of supervision rather than of active therapy.

MEDICO-LEGAL ASPECT.

Dr. W. NORWOOD EAST pointed out that suicide in English law was a felony—self-murder. Both coroners and juries usually attributed suicide to insanity, and out of 4846 inquests on suicides in the year 1928, a verdict of felo-de-se was returned only in 88. If the alternative verdict to felo-de-se was suicide the result of mental illness, the modern outlook and phraseology of the Mental Treatment Act, 1930, would be represented. An analysis of 1000 consecutive cases of attempted suicide examined by Dr. East some years ago showed that only about one-fifth were certifiable as insane, and the experience gained by the examination of more than 2000 additional cases confirmed this view. The association of murder with suicide was important. The criminal statistics for England and Wales in the years 1927 and 1928 showed that about one murderer out of four committed suicide. In some insane persons the suicidal intention preceded the homicidal; thus the altruistic melancholic, having decided to kill himself, first kills his wife to save her from disgrace and suffering.

DISCUSSION.

Dr. L. A. WEATHERLEY considered that Dr. Crichton-Miller had laid too much stress on the sex instinct and its frustration as a potent cause of suicide. When insomnia was a prominent symptom it needed prompt and definite treatment. It was sad to reflect that while relatives showered blessings upon the physician who relieved the patient of physical pain, he who attempted to get rid of mental pain and induce refreshing sleep was often stigmatised as the creator of a drug-habit. The speaker had known many men whose only hobby had been their business and their only society their business friends give up their work and retire to some town where they knew nobody. They did not play games nor read; they ceased to have an interest in life and were liable to become depressed and even commit suicide. The "herd instinct" in such cases must be educated and improved. That grand old refrain "The more we are together the happier we shall be," sung so lustily as we metaphorically blew the froth of depression to the four winds, implied the adoption of this instinct. Although golf and tennis might be too expensive or too strenuous, there was one game they could play—bowls. He had seen many miserable lives made happy in the atmosphere of friendly and sociable amusement on a bowling green.

Dr. AUBREY LEWIS said that an explanation of suicide in terms of comprehensible behaviour was inadequate. One had to consider the make-up of the

individual and the biological changes as well as the external circumstances. The relative importance of these factors varied greatly in different groups —e.g., the psychotic and the psychopathic suicides. The biological changes defied purely psychological investigation. With regard to social influences, stress must be laid upon the ethical values prevailing in the particular social group; on the positive side one found heroes and martyrs, on the negative side fanatics and self-immolators. Epidemics of suicide deserved attention; their incidence was chiefly on psychopaths, as might be seen in several common factors in such outbreaks. Dr. Crichton-Miller's remarks concerning insight and the fear of insanity leading to suicide applied only to a particular group; it was a question not of insight but of the continuance of morbid anxiety. From the point of view of psychopathology it was not justifiable to regard death by voluntary starvation as a suicidal equivalent; the fasting was generally the expression of beliefs and dreads not connected with any positive seeking after death. Revenge and hatred were very important factors in the motivation of suicide.

Dr. N. E. WATERFIELD approached the question from the point of view of cases coming under his own observation in the tropics and in England. He divided those cases into (1) those whose motivating cause was *fear*—fear of the consequences of some criminal or other act. In such cases, if the original attempt was not successful, there was a probability that the attempt would be repeated. He did not consider that fear was the cause of suicide in murderers, but that the double act was the result of the original impulse. The second cause given was "general fed-upness" with the conditions of life. The speaker regarded resort to excessive indulgence in alcohol as an attempt to secure oblivion and that, in his experience, not infrequently preceded suicide. The third cause, which more frequently resulted in attempted suicide than the accomplished act, was the desire to attract sympathy or notoriety. Dr. Waterfield gave examples of cases coming under his observation in all three groups.

Dr. G. W. SCOTT (Malay States) described a case of suicide resulting from a series of misfortunes and gave an outline of the arguments by which he tried to dissuade the man concerned from committing the act.

Dr. E. F. HOARE said that he was glad to find a section of the medical profession interested in the subject of suicide. He had kept a record of the cases of suicide coming under his jurisdiction as coroner for East Sussex and had grouped them (*a*) according to apparent causes, and (*b*) according to method adopted. Causes with relative figures were as follows: mental disease, 26; domestic and financial worry, 20 (18 of which were males); disease or dread of disease, 13; "insomnia," 7; love disappointments, 4; grief, 4. Methods adopted were: coal-gas poisoning, 16; drowning, 16; hanging, 11; precipitation from heights, 10.

The PRESIDENT considered that we should be sceptical as to the value of statistics with regard to suicide. Official figures almost certainly underestimated its incidence. To be of value, statistics should include not only the successful suicides, but also the cases of attempted suicide. These figures were obviously unobtainable, since many cases of attempted suicide are not recorded. The larger one's experience of suicidal patients, the more one was impressed with the importance of inquiring for an hereditary tendency to mental disorder, and hereditary influences could only be appraised by securing information as to the whole family tree for several generations. Suicide and attempted suicide were most often symptomatic of underlying mental disorder. It must not be forgotten that there was a class of suicide by perfectly sane people—e.g., felo-de-se. Many non-criminal suicides in sane individuals were condoned by Church and State. To this class belong the "noble army" of religious martyrs; also the equally meritorious cases of people who deliberately sacrifice their lives for the benefit of others.

Dr. R. G. GORDON considered that the origin of suicide was something deeper than the product of symptoms such as insomnia. It was probable that the understanding of suicide must arise from the study of the psychological make-up of the individual. If the personality were harmoniously organised, suicide would be an impossibility. Was there any means of recognising these cases which were not capable of such harmonious organisation in order that we might discern potential suicides and undertake preventive treatment when necessary?

Dr. DAVID RICE referred to another group of accidental or non-intentional suicides who resorted to self-injury as a physical counter-irritant to pain —physical or mental—with fatal results. Cases he had seen of successful starvation had been proved to have serious disease of the gastro-intestinal tract which the speaker looked upon as sufficient reason for refusal of food. This condition had been undiagnosed before admission and was inoperable when discovered.

Dr. JOHN BIRCH maintained that suggestion was of much greater importance than heredity in the incidence of suicide. He related instances of consecutive suicides in a certain locality coming under his personal observation in support of his contention. He also considered that there was a definite relation between tuberculosis and suicide.

Dr. F. R. P. TAYLOR drew attention to the value of social workers in assisting those who had been inmates of mental hospitals. These workers at out-patient clinics might do a great deal to assist potential suicides.

NEW INVENTIONS

A JAW SUPPORT.

WITH an artificial airway in position it is often necessary and sufficient to hold the chin up in order to obtain a free air passage while administering an anæsthetic. For this purpose I have devised the simple adjustable prop here illustrated. This fits between the clavicle below and the mandible above, and is pulled out to the length desired, where it automatically fixes itself by means of the rachet. The ends are grooved and padded to fit the bones, and the upper end is made to rotate so that it can come into line with any part of the ramus. It is sometimes necessary to hold the prop in position by means of tape tied round the neck.

The instrument has been made for me by Messrs. Allen and Hanburys, Ltd., 48, Wigmore-street, London, W.

G. A. METCALFE,
Bedford. M.B., B.Chir. Camb.

REVIEWS AND NOTICES OF BOOKS

Dangerous Drugs.

The World Fight against Illicit Traffic in Narcotics. By ARTHUR WOODS, formerly Police Commissioner in New York City, and Assessor to the Advisory Committee on Traffic in Opium and Other Dangerous Drugs of the League of Nations. New Haven: Yale University Press. 1931. 9*s*.

THIS volume, published under the auspices of the United States Bureau of Social Hygiene, owes its origin to the experience obtained by its author while acting as assessor to the League of Nations Advisory Committee on Opium. The disclosures there made of the "astounding conditions in the clandestine drug trade" led Mr. Woods to emphasise the measures which must be enforced if this narcotic drug traffic is to be controlled. The author sketches the history of the use of opium, morphine, heroin, and cocaine, their physical, mental, and moral effects, the growth of the abuse of these drugs of addiction, and the insidious extension of the illicit commerce therein. Morphine, first isolated in 1803, gained a high reputation for its anodyne and soporific properties, and its hypodermic administration, dating from 1853, extended alike its use and its abuse. Heroin since 1898 has had wide therapeutic recognition, but soon also became a drug of addiction, and popular with the underworld. Mr. Woods, unlike most writers on the subject, does not regard heroin as more perilous than morphine. While he thinks that cocaine does not enslave its addicts as morphine does, it leads to more marked physical degeneration, and finally to dangerous violence and unnatural practices.

The author's experience with the New York City police invests with authority his conclusions on the antisocial effects of drug addiction. He says that narcotic addiction undermines the energy and will of the addict, and brings on a state of indolence and dependance wherein the normal methods of earning a living are abandoned, though the necessity for money grows ever more pressing with the need for larger and larger amounts of the narcotic. In this way the use of the narcotic becomes closely interwoven with other criminal activities of the underworld habitués, and drugs become a part of a vicious circle of social corruption. Mr. Woods relates the efforts made since the Shanghai Commission of 1909, by means of the Opium Conventions signed at The Hague in 1912, and at Geneva in 1925, to effect the international control of drugs of addiction. These have been duly recorded in our columns from time to time, and we have also drawn attention to the disastrous illicit commerce in these drugs which still continues, and which led to the recent conference at Geneva on the limitation of their production. Mr. Woods believes that the only remedy is drastic action by each nation, and universal action by all nations. The disclosures at the last Geneva Conference confirm the author's assertion that a rigorous continuous supervision of narcotics by each nation through every stage in their production, manufacture, and marketing is required. Great Britain, by its Dangerous Drugs Acts of 1920–25, has endeavoured faithfully to fill its obligations under The Hague Convention of 1912, both as a producing and consuming country. On the other hand, such prolific producing countries as Turkey, China, and Persia have not hitherto ratified the Opium Conventions, while some continental countries continue to manufacture morphine, heroin, and cocaine grossly in excess of any conceivable medical or legitimate requirements.

Mr. Woods's brochure is a well-informed and well-balanced statement of the world fight against illicit trade in narcotics.

Bioassays.

A Handbook of Quantitative Pharmacology. By JAMES C. MUNCH, Director of Pharmacological Research, Messrs. Sharp & Dohme; Pharmacologist, Bureau of Biological Survey, U.S. Department of Agriculture. London: Baillière, Tindall and Cox. 1931. Pp. 958. 45*s*.

THE importance of the physiological assay, or bioassay, of drugs whose chemical constitution is unknown, or whose activity cannot be indicated by chemical methods, is shown by the considerable volume of the literature which has sprung up round the subject in recent years. There has inevitably been much unnecessary duplication of effort due to ignorance of the published work of previous investigators. The author of this book has set himself the important task of reviewing the whole literature published prior to Jan. 1st, 1930, and of preparing a critical compilation of the known facts of quantitative pharmacology. In the preliminary chapters he deals with experimental technique and the interpretation of results; and in succeeding chapters considers drugs according to their predominant pharmacological action. An important chapter is devoted to the bioassay of glandular products, and another to special types of drugs, such as anthelmintics, biological products, and vitamins. The author has set out the orthodox view, and has also noted his own experiences, and mentioned which methods appear to him most useful. From the 17,000 references which he had to tabulate and abstract, he gives over 5000 quotations, which in his view contain definite information or mark progress in the development of bioassay methods.

The book can be commended as an important and valuable work of reference.

A Treatise on Hygiene and Public Health.

Seventh edition. By BIRENDRA NATH GHOSH, F.R.F.P. & S. Glasg., Examiner in Hygiene, University of Calcutta and State Medical Faculty of Bengal. Revised and largely rewritten with the advice and assistance of A. D. STEWART, M.B., F.R.C.S.E., D.P.H., D.T.M. & H., Lieut.-Colonel, I.M.S., Professor of Hygiene, Calcutta School of Tropical Medicine. Calcutta: Scientific Publishing Co. Pp. 728. 10*s*. 6*d*.

IN this seventh edition of Dr. Ghosh's book on hygiene considerable revision has been made. Some of the discredited views to which we drew attention in reviewing the previous edition have been deleted, and on the whole the book seems now to be well up to date. Chapters 24 and 25 on village sanitation will be of special value to those concerned with hygiene in the tropics, and more especially in India. Like its predecessors, this manual supplies a remarkable amount of information, and it can be recommended to those who desire to study the problems of hygiene as they are presented to the administrator in India.

Tropical Hygiene.

Fourth edition. By P. LUKIS and R. J. BLACKHAM. Revised and enlarged by A. D. STEWART. Calcutta: Thacker, Spink and Co., 1931. Pp. 427. 5*s*.

THIS useful little book is intended for laymen as well as medical practitioners. Its chapters include sound elementary facts, served in a palatable form, which are neither beyond the comprehension of lay reader of ordinary intelligence nor beneath the notice of the practitioner young in tropical experience. All the chapters contain sound practical advice, together with some account of the ætiology and historical aspects of the diseases treated and the theoretical basis of the sanitary measures advocated. The book is amply illustrated with photographs and diagrams, and its only fault is that it is too much compressed.

Précis d'oto-rhino-laryngologie.

Par GEORGES LAURENS, Laryngologiste de l'Hôpital Saint-Joseph. Avec la collaboration de MAURICE AUBRY, Laryngologiste des Hôpitaux, et ANDRÉ LEMARIENZ, Assistant de laryngologie. Paris: Masson et Cie. 1931. Pp. 1224. Fr.120.

Dr. Georges Laurens and his colleagues have succeeded admirably in giving a concise account of diseases of the ear, nose, and throat. Even the rarer conditions receive adequate mention, and small points in diagnosis and treatment are rarely omitted. The authors have wisely avoided the tabular form of presentation, and the text is readable in spite of condensation. Operations are, of course, not fully described, but their principal features are indicated. The sections on treatment are, on the whole, the most condensed; and it would have been helpful to set out the method of administration and the dosage of the drugs mentioned.

The work is well up to date, and the methods of treatment recommended are generally sound, though they differ somewhat from those prevalent in this country, notably in the recommendation of partial tonsillectomy in children. The method of tonsillectomy with the blunt guillotine, described as the Sluder-Ballenger operation, is said to be of American origin, and the earlier work of Whillis and Pybus in England is not mentioned. The authors state that treatment of cancer of the larynx by radium has been abandoned because of its uselessness and its dangers. The numerous illustrations are mostly semi-schematic drawings; they are clear, and of real assistance in following the text. There is a good index.

Diseases of the Gums and Oral Mucous Membrane.

Fourth edition. By Sir KENNETH GOADBY, K.B.E., M.R.C.S., D.P.H., Lecturer on Bacteriology of the Mouth, Dental Department, University College Hospital. London: Humphrey Milford, Oxford University Press. 1931. Pp. 496. 42*s*.

THE borderline between odontology and general medicine has not received the attention it deserves from medical men or from dentists. This book skilfully unites the specialised and the general aspects of dental disease. The present edition has been revised and extended by over 80 pages. A new chapter on dental caries shows that the author accepts Mrs. Mellanby's view that caries is a deficiency disease. Recent work on the relation between vitamin A and pyorrhœa receives attention in the chapter on disease of the dento-alveolar articulation. The chapter on the bacteriology of the mouth has been rewritten and brought up to date, and that on vaccine therapy, a subject with which the author is particularly associated, is a moderate statement of the claims and limitations of vaccines in the treatment of diseases of the periodontal membrane. The illustrations are numerous and good, the number of coloured plates having been increased in this edition. The drawing which illustrates actinomycosis of the jaws is specially good. The book will continue to make an appeal both to the dentist who wants to learn something of various morbid conditions of the mouth, and the practitioner of medicine who wants to read about dental disease without being led into highly technical avenues.

A Manual of Normal Physical Signs.

Second edition. By WYNDHAM B. BLANTON, M.A., M.D., Assistant Professor in Medicine, Medical College of Virginia. London: Henry Kimpton. Pp. 246. 12*s*. 6*d*.

Dr. Blanton's small volume on normal physical signs is designed primarily to aid the student in his work in the wards. It is arranged in schematic form for the sake of brevity. The main points in anatomy and surface anatomy are included, with some 49 diagrams and figures. It is questionable to what extent such purely tabulated collections of methods of examination and their uses are of assistance to the junior student; certainly they can in no way take the place of actual instruction in the wards. Some of the methods are described imperfectly, some are ignored. Thus we find under gall-bladder, "duodenal tap of some value, Murphy's sign, Hook fingers over ribs and note inability to breathe," cryptic remarks well calculated to mystify the student. The patient who is told the 14 rules to be observed by him when submitting to auscultation is likely to become restive; the last of 11 tabulated sources of error during auscultation is "trouble with stethoscope: (*a*) one tube occluded, (*b*) one tube broken or cracked, (*c*) held upside down." Such minutiæ tend to obscure important principles and lessen the value of an otherwise useful little volume.

Les premiers jours du nouveau-né.

By Prof. MARCEL METZGER and Dr. ANDRÉ HÉRAUX. Paris: Gauthier-Villars et Cie. 1931. Pp. 444. Fr.40.

THIS book restricts itself to the infant during the first fortnight of life, and enters into the physiological and pathological features of this period in greater detail than would be possible in a less specialised work. It is divided into four sections. The first is concerned with normal infants, and deals fully with management and hygiene, and with the initiation of breast-feeding. The second contains an account of diseases and congenital malformations, dealing with the differential diagnosis of symptoms, such as jaundice. A valuable section follows on the clinical manifestations of pathological heredity, with special reference to syphilis. The book ends with a series of short summaries of individual cases seen by the authors, accompanied by temperature and weight charts. It should provide a useful guide to students and practitioners engaged in midwifery.

THE LANCET.

LONDON: SATURDAY, OCTOBER 3, 1931.

BLOOD-SUGAR IN PSYCHOSES.

THE studies of sugar tolerance in psychotic subjects published at p. 731 of our present issue should be of great interest to psychiatrists, because they throw light on a perplexing series of observations. The whole story of recent research into the bodily symptomatology of mental disorders is well illustrated by the investigations of carbohydrate metabolism recorded during the past few years. Not only metabolic abnormalities but disturbances of the endocrine organs and of the vegetative nervous system have been reported with a frequency that implies that they have some pathological significance, but also with such inconstancy that attempts to build them into any systematic pathology appear to be hopeless. Such observations as those of Dr. MCCOWAN and Mr. QUASTEL, and those on respiratory and acid-base disturbances lately made by other workers, give these findings a new significance. In studying the psychoses, to look for static signs of bodily disorder such as we are accustomed to find in the diseases of general medicine, is probably to look in vain. We cannot hope to obtain reactions equivalent to the Wassermann or the agglutination tests as permanent distinguishing features of forms of mental disease. If such static differences are present they are probably too minute to be demonstrated by our methods. It is not to the static but to the dynamic aspect of the disorder that research must be addressed. Put the psychotic organism to some stress—whether it be metabolic or emotional or stimulation by drugs, inhalation of carbon dioxide or by hormones—and the response will usually be found abnormal. In a collection of any observations the fortuitous occurrence of some conditions of stress inevitably gives rise to the abnormal conditions which prove so puzzling when they are scattered among a series of apparently normal measurements.

Dr. MCCOWAN and Mr. QUASTEL have examined the relation of the blood-sugar curve to the emotional state and to the bodily concomitant of emotion evidenced by the so-called psychogalvanic reaction. They find a close correspondence between the results obtained by the two methods in so far as emotional states are concerned. By both types of reaction a needful check is afforded on the reality of a state of emotional stress. Their work seems to confirm the observation that the external manifestations of emotion cannot always be taken at their face value, especially in the hysterical mode of reaction. From their results it appears that the abnormalities of the blood-sugar curve found so often in manic-depressive psychoses are in the main a bodily manifestation of emotional stress, and that the variations may afford valuable prognostic information. The expression of these abnormalities in terms of a hyperglycæmic index may arouse some antagonism, for it must not be forgotten that the figures expressing ratio which they characterise by this name do not bear a simple relation to the degree of retardation, and cannot be legitimately used for simple comparison. There should, however, be little difficulty in constructing a mathematical expression of the varying delay in reaching a normal blood-sugar level.

The significance of the disorders of carbohydrate metabolism in the psychoses has yet to be fully explained; but meanwhile Dr. MCCOWAN and Mr. QUASTEL have given a new orientation to part of the problem, and their results, if confirmed, will have much practical importance.

FOOD POISONING.

IT seems from Sir GEORGE NEWMAN'S report [1] that there has been some diminution lately in the number of outbreaks of food poisoning in this country. Not all such outbreaks are reported to the Ministry of Health, but all the larger outbreaks, and most of those in which there is a fatal case, are sure to come to the notice of the medical staff there. In 1930 25 outbreaks were reported as compared with 30 and 45 in the two preceding years; in all but three instances the bacteriological investigations were done in the pathological laboratory of the Ministry. Although full details are not given of any of the outbreaks it is evident that the same features crop up year after year. Made-up meat foods are, as usual, the commonest vehicles of infection, and the report incriminates pork pies in several outbreaks. An unusual feature in one of these was the spread of infection through many districts. The veal-and-ham and pork pies had been distributed very widely, producing outbreaks in districts as far as 200 miles apart; 105 cases of more or less severe illness were reported in all, with two deaths. At least 45 pies were suspected of having conveyed infection, all belonging to the output of one factory on one particular day. The *aertrycke* bacillus was found in the pies and in the excreta of the sufferers. Gelatin has been suspected from the time of EDWARD BALLARD (1890) and in last year's outbreak suspicion fell on the practice of adding a solution of gelatin to the pies after they had been cooked and cooled. There was a possibility in this instance that the prepared gelatin solution left overnight had been infected by the droppings of birds, but the source of infection is still the weak link in the chain of evidence. There is great need, the report states, of information as to the precise method by which food becomes contaminated with these bacteria and particular attention should be paid to any material, the examination of which

[1] On the State of the Public Health. Pp. 181–4. Annual Report of the Chief Medical Officer of the Ministry of Health for the Year 1930. H.M. Stationery Office. 4s.

might reveal the existence of reservoirs of infection. The present report adds nothing to our knowledge in this direction.

On the other hand, knowledge of the bacteria concerned in food poisoning is steadily growing. The number of types of the salmonella group associated with such attacks is indeed bewilderingly large and adds materially to the difficulty and labour of investigation. In the present report a new type "Newcastle" is mentioned as responsible for an outbreak of three cases of mild poisoning at Hove due to pickled beef. This type had been described previously in Berlin, but hitherto had not be associated with any such outbreak. The American type of *B. suipestifer*, conveyed by a pork pie, was responsible for eight cases with three deaths at Walsall. Apart from a single fatal case at Wolverhampton in 1927, this was the first appearance in England of this strain in connexion with food poisoning. Altogether the 25 outbreaks were responsible for 292 cases of illness and 16 deaths. In six outbreaks *B. aertrycke* type was identified, in two *B. enteritidis*, and in one each the types "Newcastle" and American *suipestifer*. In one case in which no definite history of food poisoning could be elicited the Thompson type was identified in the pus of an empyema. In five outbreaks no living pathogenic bacteria could be detected in any of the material examined. These were toxin outbreaks which showed the almost invariable features—viz., very short incubation period, symptoms of moderate severity, very rapid recovery. The other striking characteristic, very abrupt onset, is not mentioned. They were ascribed to canned salmon (two outbreaks), tongue, canned beef, and canned lobster, but there was considerable doubt as to the ætiological connexion of the last vehicle in an outbreak which involved 40 cases. Excluded from the list were eight outbreaks of gastro-enteritis, due to the Flexner group of dysentery bacilli, in which various articles of food were suspected. One outbreak is ascribed to ice-cream, and the report adds, "it is not easy to draw a clinical and epidemiological distinction from food poisoning; the bacteriological findings alone warrant the separation." Dysentery bacilli were first described as a cause of food poisoning by W. G. SAVAGE and P. BRUCE WHITE, and unless a bacteriological definition is to be given to food poisoning there seem no good grounds for not including them, when food is the vehicle, as outbreaks of food poisoning.

The report illustrates the valuable work which is being done in the pathological laboratory of the Ministry of Health. Food poisoning can, however, hardly be controlled until the gaps in our knowledge of the paths of infection and of the precise reservoirs of the salmonella bacilli are better understood. Some of this knowledge should come from thorough investigation of actual outbreaks, but an equally valuable field is direct research into the distribution of these bacilli, particularly in relation to animal diseases. Not very much has been added to our knowledge of recent years from either branch of study, but the second line of approach is suffering from neglect. A recent outbreak of food poisoning at Chesterfield is a reminder of the need for further research.

HOSPITAL CONTRIBUTORY SCHEMES.

THE most important outcome of the annual conference of British hospital contributory schemes which has just been held at Rugby was the decision to establish a British Hospitals Contributory Schemes Association. There are now so many of these enterprises, they have achieved so high a measure of success, and their number is certain to be so largely increased in the near future that such a measure of coördination and coöperation has become very necessary if the best results are to be obtained. There could be no doubt of the representative character of the conference, which consisted of 110 delegates from 55 towns in all parts of the country, under the presidency of Major B. J. T. FORD, the chairman of the management committee of the remarkable Birmingham Hospitals Contributory Scheme. The objects of the Association are defined as being to encourage the extension of contributory schemes; to institute a clearing house for tabulating information and making suggestions; to prepare model schemes for inquirers; to advise associated schemes in times of difficulty; to be at the disposal of those seeking information when contemplating the establishment of schemes; to publish and circulate an annual report; to form a body representative of the associated schemes, and to arrange an annual conference of such bodies. Major FORD was appointed president, and an executive committee was formed consisting of men of especial experience. The Association ought to be able to do work of real value, especially in the prevention of overlapping, of which there is already some danger, and clearly defining the limits of regional schemes. Large hospitals draw their patients from so wide an area that it is becoming difficult to limit the operation of contributory schemes to merely urban boundaries, yet local jealousies are easily aroused, and may as easily produce unfortunate results.

In a paper on the payment of hospital staffs Sir ROBERT BOLAM declared that the present system is breaking down so far as those staffs are concerned, and that one of its faults is that the general hospital provision for the artisan and lower middle class is "grossly inadequate." As regards the staffs the system is "rotten." "You have compelled them to spend half their time in hospital for nothing, or next to nothing, and then compelled them to go out for the rest of the day and act as extortioners from the people who do not come to hospital. The man is honorary in hospital life and mercenary in private life." Sir ROBERT went on to say that the cost of medical service to the private person is "absolutely absurd, and altogether beyond what it ought to be," and that the profession is satisfied that some other means ought to be adopted for financing the consultant services. He added that "the profession honestly believed that it was best to have part-time service—that the man should keep in touch with the amount

of private work that was to be done outside, and that it should be made worth his while to do the most progressive work in the hospital." The discussion on the paper showed considerable divergence of opinion, and no resolution was submitted. The curious question arose of whether contributory schemes should be operated primarily in the interests of the voluntary hospitals or of the contributors. Diametrically opposite views were expressed, and the president pointed out that any scheme was worthless which had not as its foundation a union of interests between hospital and contributor.

THE NATURE OF VIRUSES.

DURING the week two pronouncements have been made on the biological nature of viruses. Dr. H. H. DALE introduced from the chair a discussion on this subject at the Physiological Section of the British Association, and Prof. JAMES MCINTOSH commended it to the notice of students beginning their course at the Middlesex Hospital. The virus is almost as infinitely small as the solar system is infinitely large; the smallest known virus is, in fact, actually smaller than a molecule of hæmoglobin. Nevertheless, as Prof. MCINTOSH insisted, it could still contain a score or more of protein molecules, and its only similarity to a ferment or enzyme is that both can act in minute quantities. A ferment or enzyme cannot, he added, increase or multiply. Dr. DALE, too, remarked that the dimensions assigned to the units of some viruses might well make one hesitate to credit them with the power of active self-multiplication. Experience however provides no analogy for the growth of such a substance by self-synthesis from the constituents of a lifeless medium. He had little sympathy with the suggestion that the presence of the virus in a cell in some way constrains the metabolism of the cell to produce more; and he closely argued the drawbacks to this view, adding a new one to the effect that it would be difficult to imagine that a virus like rabies could be permanently excluded from this country, as it has been, if it had an autogenous origin. In answering the question, what do we mean by a virus? Dr. DALE admitted that definition was more difficult than a few years ago, when it was possible to accept three cardinal properties—viz., invisibility by ordinary microscopical methods, non-retention by a filter fine enough to prevent the passage of all visible bacteria, and inability to propagate itself except in the presence of the cells which it infects. The failure of such a definition to effect a sharp or stable demarcation is, he said, progressive. To be consistent we must include among viruses, on the one hand, the filtrable agents transmitting certain tumours, and, on the other hand, the agents of transmissible lysis known as bacteriophages. Microscopic visibility is obviously a loose term; those who hold by it are tempted either to exclude an agent from the group of viruses as soon as the microscope can demonstrate it, or to regard the minute bodies which are seen or photographed as not really the infective agent but products of a perverted metabolism which its presence engenders.

Accepting this inherent difficulty in defining logically the group of viruses, Dr. DALE set out his own position in the following way.

"The viruses," he said, "seem to form a series; but we do not know whether the series is real and continuous, or whether it is formed merely by the accidental association, through a certain similarity in effects, and through common characteristics of a largely negative kind, of agents of at least two fundamentally different kinds. If we approach the series from one end, and watch the successive conquests of microscopical technique; or if we consider the phenomena of immunity over the whole series; we are tempted to assume that all the viruses will ultimately be revealed as independent organisms. If we approach from the other end, or consider analogies from other examples of a transmissible alteration of metabolism, we may be tempted to doubt the significance of the evidence provided by the microscope, and to conclude that all viruses are unorganised, autogenous, toxic principles. If we take the cautious attitude of supposing that both are right, and that viruses belonging to both these radically different types exist, where are we going to draw the line? Is the test to be one of unit dimension? If so, what is the lower limit of the size of an organism? Are we to suppose that inclusion bodies can only be produced by viruses which are independent organisms? And if so, does this conclusion also apply to the "X" bodies associated with the infection of plant cells by certain viruses? If we try to form an estimate of the lower limit of size compatible with organisation, we should remember that particles which we measure by filters of known porosity, or by microphotographs, need not be assumed to represent the virus organisms in an actively vegetative condition. They may well be minute structures, adapted to preserve the virus during transmission to cells in which it can resume vegetative life. . . . Workers in the cytology of genetics, accustomed to picturing a complex of potentialities as somehow packed into the compass of a gene, may find less difficulty, than does the bacteriologist, in attributing sufficient organisation, for true self-reproduction, even to particles still far beyond the range of detection by the microscope."

Prof. MCINTOSH told the Middlesex students that the science of bacteriology has led to the control of most infective diseases. Dr. DALE told the British Association that the near future seems likely to give us an epoch of not less important discovery concerning the viruses. No one familiar with the work of ROUS and MURPHY and its later developments can, he thinks, doubt that in the advance of knowledge concerning the nature of the viruses in general lies the brightest hope of finding a clue to the secret of the malignant tumours. Even if no new PASTEUR should arise to reconcile scattered and conflicting indications in an order yet unseen, there is prospect of advance along a wide front common to many workers in many countries.

Lord Wakefield last week opened a new X ray department at Hayes (Middlesex) cottage hospital as a memorial to the late Dr. E. J. Parrott, the founder of the hospital.

ANNOTATIONS

INSULIN ACTION AND DOSAGE.

OF recent years in the treatment of diabetes many clinicians have been using diets containing a relatively large proportion of carbohydrate, with a higher dosage of insulin than was formerly advocated. Much larger doses of the hormone have also been tried in the treatment of coma, but it has been found that the rate of fall of blood-sugar and disappearance of ketosis are not proportional to the amount of insulin employed. It appears that small doses of insulin are relatively more effective than large in readjusting the disordered carbohydrate mechanism, and the practical application is that where a single large dose appears inadequate in the treatment of a given case, it may be found that the same total amount given in repeated small doses will bring about the required result. These clinical findings are borne out by the experimental work of F. N. Allan [1] who, working with depancreatised dogs, showed that the dextrose equivalent of one unit of insulin decreased progressively as the dosage of insulin was raised. Similarly in the normal animal during sugar absorption C. F. Cori [2] (using rats) and M. W. Goldblatt [3] (with rabbits) found an actual decrease in liver glycogen after the injection of insulin, suggesting that where an optimum of insulin is already available from a normal pancreas, further amounts cannot accelerate glycogen formation.

The question whether any toxic effects are directly attributable to massive doses of insulin in rabbits protected from hypoglycæmia by repeated glucose administration, and the relative effects of massive and "small" doses on liver glycogen and hyperglycæmia, has lately been investigated by R. F. Loeb, E. G. Nichols, and B. H. Paige.[4] These workers were unable to demonstrate any toxic effects due to massive doses of insulin in seven and a half hours, thus confirming the clinical observation of H. A. Byworth [5] who satisfactorily treated a case of diabetic acidosis with 1715 units of insulin in the course of 36 hours. No definite histological changes were found in the adrenal glands of the animals studied, in contrast to the findings of Poll,[6] who used animals which were *not* protected from insulin shock by dextrose. The figures given for the effects of various doses of insulin on the hyperglycæmia following repeated dextrose feeding by stomach-tube are not conclusive owing to the very great variations between animals in the same group; they appear to show, however, that the effect of massive doses was not greater than that of "small." (The "small" doses used—7 units per kg.—were only relatively so, and were probably actually in excess of the optimum.) The liver-glycogen values were lower in the insulinised animals than in the controls in spite of marked hyperglycæmia, and this agrees with the findings of the authors already quoted.

Present-day theories of insulin action—of which none can be said to explain satisfactorily all the experimental facts—are largely based on the many and elaborate estimations of liver and muscle glycogen which have been carried out on rats and mice by H. W. Dudley and G. F. Marain, C. F. and G. T. Cori, and others. Considerable interest attaches therefore to the recent findings of G. Agren, O. Wilander, and E. Jorpes,[7] who describe a marked diurnal and nocturnal variation in the glycogen content of the liver and muscles of rabbits, rats, and mice. The changes appear to be largely independent of the intake of food, and suggest that in rabbits—where they are most striking—considerable glyconeogenesis at the expense of the body proteins takes place during the night. If these results are confirmed, it is possible that much of the accepted experimental work on large groups of rats will have to be revised unless careful control has been exercised with regard to the exact times of day at which the estimations of glycogen have been made. It is possible that some at least of the apparent anomalies of insulin action will prove to be explicable on this basis.

[1] Amer. Jour. Physiol., 1924, lxvii., 275.
[2] Jour. Biol. Chem., 1926, lxx., 557.
[3] Biochem. Jour., 1929, xxiii., 83, 243.
[4] Arch. Int. Med., July, 1931, p. 68.
[5] Brit. Med. Jour., 1928, i., 801.
[6] Med. Klin., 1925, xxi., 1717.
[7] Biochem. Jour., 1931, xxv., 777.

MEDICINE IN THE AIR FORCE.

"THE medical services of the Royal Air Force are organised first for the prevention of disease, and secondly for the care and treatment of the sick and injured." And the excellent handbook[8] for medical officers which opens with these words manages to retain a "prophylactic tone" throughout its 238 informative pages. For the general reader the first interest of such a book lies, of course, in the problems which are special to flying—for instance, the effect of high altitude on the airman. Here he will learn that the results of oxygen-lack are usually not appreciated by the subject, who therefore cannot rely on his sensations to tell him whether oxygen administration is necessary. Accordingly precautions must be taken beforehand to make sure that there shall be no shortage. As illustrations of this lack of judgment is mentioned the case, during the late war, of an observer returning from high flying reconnaissance, thoroughly pleased with the success of his flight, who discovered that he had taken 18 photographs on one plate. Another pilot, meeting enemy aircraft at 19,000 feet, cheerfully waved his hand to them, but took no further action despite the protests of his observer. On the physical side we have the well-known effects of high altitude on the tympanic membrane. The drum may be forced outwards during ascent if the Eustachian tube is obstructed, but more usually the pressure is counteracted by opening of the tubes on swallowing, and it is during a rapid descent that the necessary adjustment fails. If the airman has reached 20,000 feet the pressure on landing may be as much as 760 mm. outside and only about 380 mm. within the middle ear, and the drum is therefore forced inwards. The result may be deafness, pain, vomiting, dizziness, or even fainting, and the importance of nasal hygiene which will prevent obstruction is obvious. As the throat is apt to be parched at high altitudes because of mouth breathing, swallowing may become difficult, and the use of chewing-gum is recommended. The mention of this humble preventive is an instance of practical outlook of those who have compiled the manual. The chapters on psychoneuroses and on the methods of spread of infective diseases, as well as the means of investigating suspected cases and making an early diagnosis, are clear and concise, and would be useful to many readers outside the Air

[8] Manual for Medical Officers of the Royal Air Force. 2nd ed. London: H.M. Stationery Office. 1931. Pp. 238. 4s.

Force. The instructions on the collection of laboratory specimens, their transmission by post, and the particulars which should accompany them, are such as ought to find a place in all text-books of practical medicine. Their dissemination would save pathologists a lot of time, and would make for more efficient diagnosis.

It will be a surprise to many to know that blood-culture is included amongst the routine tests used in any case where the fitness of an airman is in question. It is admitted that, as a rule, the result is negative, but the few early positive cases in which correct and immediate treatment has resulted from its use already justify the test as a routine procedure.

SERO-DIAGNOSIS OF SYPHILIS.

In 1923 a laboratory conference on the sero-diagnosis of syphilis, convened by the Health Organisation of the League of Nations, was held at the State Serum Institute at Copenhagen. Subsequently several of the sero-diagnostic methods were improved and a number of new tests were elaborated, notably such as depend on changes directly visible in mixtures of syphilitic serum and extract, the so-called flocculation tests. A second laboratory conference was accordingly held at Copenhagen in 1928, attended by 40 pathologists belonging to 17 countries, its purpose being to compare the results obtained by these flocculation tests with those based on the Bordet-Wassermann reaction. At the invitation of the Uruguayan Government this work was continued at a third laboratory conference held at Montevideo last year, the report [1] of which is before us. Seven Bordet-Wassermann techniques (six of which were modifications of the original method) and four flocculation techniques were compared.

The four flocculation techniques were (i) Kahn "standard," (ii) Kahn "presumptive," (iii) Müller "clotting," (iv) Meinicke "clarification." Prof. Kahn himself performed numbers (i) and (ii); (iii) was done by Prof. Müller and his assistant; (iv) by Dr. Jolland-Düssert, of Santiago de Chile. A twelfth method (sero-hæmo-flocculation test of Prunell) was withdrawn in the course of the conference. Out of the 11 methods, seven (six B-W techniques and the Meinicke clarification test) were performed by representatives of various South American countries. The remaining four were methods which, with the exception of the Kahn "presumptive," had been well tried at the previous conferences at Copenhagen, and were carried out by the same workers as at those conferences—namely, Kahn ("standard" and "presumptive"), Müller ("clotting"), and Wyler (B-W modification). During the conference 966 sera and 200 cerebro-spinal fluids were examined, 304 and 147 of which respectively were derived from cases in which syphilis could with reasonable probability be excluded. Each sample of serum was divided up into a number of small samples corresponding to the number of research workers. These samples were distributed for examination bearing only a number, just as had been done at the earlier conferences, so that the serologist was unaware of their origin or of the clinical diagnosis, which was not divulged until all the workers had submitted a written report of their findings.

The results obtained agree with those reached at the Copenhagen conference in 1928, where the best flocculation test was demonstrated to be generally superior as regards sensitiveness, and equal in point of specificity to the best B-W reactions. The majority of the serologists taking part in the Montevideo conference agreed that in the hands of Prof. Kahn himself, the Kahn "standard" test—as was the case at the Copenhagen conference—was the best of the four flocculation tests under trial, being absolutely specific and extremely sensitive with both sera and cerebro-spinal fluids. The Kahn "presumptive," the Müller "clotting," and the Meinicke "clarification" tests each gave a small number of false positive results. Out of the seven complement-fixation methods compared, only three gave absolutely specific results as far as the 966 sera were concerned (Sordelli, Scaltritti, Wyler). In the case of the 200 cerebro-spinal fluids, Wyler had absolutely specific results; the Scaltritti method yielded one false positive result; Sordelli was not enabled to carry out any tests on account of the necessary limitation of the available material.

Comparing the sensitiveness of the two complement-fixation techniques (Sordelli, Wyler) and the one flocculation technique (Kahn), which yielded perfectly specific results, the former, while closely similar to one another in sensitivity, gave about 9 per cent. fewer positive results with syphilitic material than did the Kahn test. It can, however, be seen from the tables embodied in the report that in certain cases of syphilis—about 3 per cent.—the Kahn test gave a completely negative or doubtful result against a definite positive by one or both of the complement-fixation tests of proved specificity. It was therefore urged at the conference that, in order to obtain a greater guarantee against possible errors, it is best to employ two different diagnostic methods, a Wassermann and a flocculation, in parallel. This is substantially in agreement with the recommendations of the laboratory conference at Copenhagen in 1928.

Among the sera submitted to test were 27 from cases of leprosy (nervous, tubercular, and mixed). Detailed clinical examination of these cases yielded no evidence of syphilitic infection. The well-known fact that leprosy often gives non-specific positive reactions in sero-diagnostic syphilis tests was confirmed at the conference in every one of the methods compared. These cases were placed in a group apart, and were not considered as non-specific control cases.

[1] London: George Allen and Unwin. Pp. 131. 3*s.* 3*d*

DENGUE AND YELLOW FEVER.

In 1923 C. Bonne at Surinam suggested that dengue fever might perhaps protect its convalescents against yellow fever. In recent papers in the Dutch medical press J. E. Dinger and E. P. Snijders have noted the similarities of these two diseases, among them the saddle-shaped (double maximum) temperature curve, the muscular pains, the conveyance by aedes, the infectivity of the patient's blood during the first three days of the fever, and the filter-passing character of the virus. They observed, when inoculating monkeys, that cynomolgi from districts in the Dutch East Indies where dengue was endemic were less susceptible to yellow fever infection (except when young) than were rhesus monkeys from North India where dengue was absent. This line of investigation has now been followed further at the Tropical Hygiene Institute at Amsterdam.[1] They were fortunate in finding 14 volunteers willing to be bitten, at Amsterdam, by *Aedes egypti* or *A. albopictus* which had fed on dengue patients in the Dutch East Indies, or by mosquitoes bred in Holland from infected aedes or by aedes infected in Holland from other cases of dengue. Their paper gives a full account of the results. The incubation period was usually three but perhaps up to ten days, the exanthem was associated rather with the second (and higher) peak of the pyrexia, while the blood showed an acute leucopenia with disappearance of eosinophils at the height of the fever. The pyrexia has usually two maxima, but the first may be absent, and after the

[1] Arch. f. Schiffs- u. Trop.-Hyg., September, 1931, p. 497.

second the white cells begin to increase rapidly. The authors hold that van Scheer's five-day and Rogers's seven-day fevers are variants of dengue.

Dengue is more dangerous to monkeys than to man and of 26 infected animals, 14 died. Six of the deaths were from intercurrent diseases, but the other eight monkeys presented appearances similar to those of yellow fever. The 12 which recovered were infected with yellow fever and one died, after two days, of intercurrent disease, while three died of yellow fever (one had perhaps been given too little time for immunity to develop) and the remaining eight survived. Ordinarily, it is stated, 90 per cent. of monkeys exposed to yellow fever die, but here only three died out of 11 (27 per cent.), and it is concluded that those which recover from dengue acquire pretty often an immunity against yellow fever.

Thus the Amsterdam experiments are held to support Bonne's suggestion, and in Dinger and Snijders's opinion should lessen anxiety about the possible introduction of yellow fever into the Dutch East Indies, where dengue is common. It would be interesting to know whether yellow fever has ever been observed in people lately convalescent from dengue.

CIGNOLIN IN DERMATOSES.

THE introduction of cignolin gave dermatology one of its most useful remedies. Used in the right way for the right case, it is as easily controlled and rapidly effective as any other single drug. Originally synthesised to take the place of chrysarobin—whose composition and action are notoriously irregular—it is apparently free from toxic action on the kidneys, and in weak concentration can be applied even to the scalp without any danger of a secondary conjunctivitis. Although probably the best application in the treatment of psoriasis, it is evidently useful in a variety of other conditions. D. Kenedy [1] reports that in Török's clinic at Budapest it has been used for a number of years for various superficial dermatoses occasioned by fungi and yeasts, in intertrigo due to streptococcal infection, and in so-called dysidrotic manifestations on the palms and soles, which frequently relapse and defy every other known method of treatment, including X rays. The prescription [2] is: Cadogeli, 1·0; cignolini, 0·1–0·2; benzoli, 10·0. The method of application is very simple, the affected areas being painted with the solution twice daily and then covered with strips of dry white gauze. If there is already much eczematisation or irritation, the painted areas are further protected with a thin layer of Lassar's paste, or calamine lotion, while if the paint appears itself to be causing irritation the proportion of cignolin can be reduced by a half or more. The combination of cignolin and tar follows the indications closely, for the former has a powerful parasiticidal action, and the latter is unrivalled for its soothing and antipruritic properties. It will, of course, be realised that the above treatment applies only to the chronic relapsing types of infection, which are well known to be difficult to control and cure. Where there is much sepsis the usual surgical principles must be observed—e.g., opening of bullæ, evacuation of pus, and immersion for short periods in weak antiseptics such as potassium permanganate solutions. Kenedy quotes examples of cures of oidiomycotic, epidermophytotic, blastomycotic, and streptococcal (intertriginous) infection, mostly of the hands and feet, in from two to eight weeks. They had previously resisted all other accepted forms of treatment, including X rays.

[1] Derm. Woch., 1931, xciii., 1195.

[2] Cadogel, a proprietary tar preparation, cannot easily be obtained in this country, but deodorised oil of cade is a good substitute. A suitable formula would be: Ol. cadini (deod.) ℥ 40; cignolini, gr. ½; benzoli rect., 1 oz. Only small quantities should be ordered, for the tar tends in time to be precipitated.

"LA CURE MARINE."

AN international review bearing this title has recently appeared in Belgium, with an introductory statement by Dr. Armand Delcroix, who has been for more than 30 years director of the Marine Sanatorium at Ostend. Dr. Delcroix's claim is that medicine has, so far, failed to destroy the germs of disease in the body; that hygiene cannot guarantee a pure atmosphere in the towns; that phototherapy cannot replace fresh air; that it is still necessary to have recourse to ideal surroundings; and that the curative properties of Nature must be put on a rational basis. The aim of the review is to bring together from all countries the fruits of medical observation and discovery at the seaside, especially in the case of delicate children, and so to establish what Dr. Delcroix calls a scientific chart for the sea. A similar aim inspired the International Congress of Thalassotherapy formed in France in 1914, which met in May of the present year at Berck-sur-Mer, and the new section of the B.M.A. at Eastbourne in July.[1] It is true that there has been, in recent years, a great increase in the number of children sent to the seaside in the summer months, to marine hospitals, convalescent homes, and holiday colonies. Many such hospitals, especially those for tuberculous children, are now kept open all the year round. But in spite of an unprecedented recourse to sea-bathing there is still much ignorance of the laws which govern the modification of the organism at the seaside. The first number of *La Cure Marine* prepares the way for better understanding by giving a sketch of the modern development of marine treatment. In 1825 Dubar, a surgeon of Ostend, published a "Guide for Bathers"; Noppé, in 1832, wrote wisely on climatic adaptation; whilst Jumné, in the 'forties and 'fifties, established the practice of seaside treatment. The first marine hospital at Middelkerke followed in 1885, and the sanatorium at Ostend in 1897. In France the first establishment for sea-bathing was that of Lepec, founded at Dieppe in 1778. Baumé, in 1805, recommended sea-baths as "the most energetic remedy for scrofula," and Le François noted in 1812 that girls bathing in the open sea at Dieppe acquired resistance against the pernicious effects of the flimsy mode of dress then prevalent. Later, Trouville became a favourite sea-bathing resort, and then Biarritz, under the auspices of the Empress Eugénie. From that time in France, says Dr. G. Léo, dates the era of seaside hospitals and sanatoria "for the disinherited of life." In 1850 the city of Paris sent 20 scrofulous children to St. Malo for a three months' cure; in 1861 a wooden hospital with 100 beds was erected at Berck-sur-Mer, which has since become an acknowledged centre for the treatment of non-pulmonary tuberculosis. Many establishments with the same purpose are now to be found on France's three coasts. In Italy Barellai was the apostle of this branch of physical medicine. According to Dr. Ceresole, of Venice, the first marine hospital was set up by the town of Lucca at Viareggio in 1842, and another for children from Florence in 1854. These early hospitals were open only in summer;

[1] See THE LANCET, Sept. 19th, p. 637.

the first permanent Italian marine hospitals being again founded for the town of Lucca in 1901. It is said that there are now more than 250 charitable establishments at the seaside in Italy, including permanent and summer hospitals for curative treatment and many preventoria or marine colonies, and that more than 100,000 children are annually referred to coastal health resorts. In this country premier place belongs to Russell's classical work, which appeared in 1750, and among marine hospitals to the Seabathing Infirmary, founded by Lettsom at Margate in 1781. In Germany Beneke, of Marburg, established the first marine hospital at Wyk on the Island of Föhr in 1881. Dr. Carl Häberlin, the present director of this hospital, presented to the Eastbourne section his careful observations made upon large numbers of children from German cities. His conclusion, briefly stated, was that for delicate children cures at the seaside cannot be replaced by anything of equal value. A caveat is however necessary in recommending the seaside for children. The movement for the systematic medical care of subnormal children, which is evident in many countries, has little in common with the vogue of the plage or seashore for popular sea- and sun-bathing. The role of light and water and air in marine climates as a mode of treatment can only be rightly appreciated by patient investigation and experience. We welcome the proposed medical organisation to promote the scientific development of these forms of treatment in the British Isles. The facilities for modern marine treatment in England, both in summer and winter, are one of the undeveloped national assets.

THE TONOSCILLOGRAM.

LAST January in our columns Dr. J. F. Halls Dally [1] drew attention to Prof. J. Plesch's tonoscillograph, an instrument designed to give graphic and permanent records of arterial and capillary pressures, together with individual pulse characters. Since then Plesch has given a much fuller account [2] of his methods, and shows that the possibilities of the instrument have been further developed. Apart from the advantage of having permanent records of blood pressures, he demonstrates on a mathematical basis that it is possible to get the absolute arterial pressures, maximum and minimum, by eliminating errors introduced by variations in thickness of tissues and arterial wall, and that he can thereby obtain more accurate readings than can be got with auscultation. Other points of interest have appeared in the course of his investigations. There seem to be in the tonoscillograph curve two entirely independent components, differing in kind and origin—namely, the pulse curve, a pure resultant of the heart's action, and the development curve, a resultant of the elastic condition of the artery wall. The four characteristic points of the tonoscillogram are maximum and minimum pressures on the one hand and total maximum and total minimum pressures on the other hand. Absolute values and differences between maximum and minimum pressures are constant characteristics of the pulse curve, and therefore the gauge of the important work of the heart. On the other hand, the difference between the total maximum and maximum and total minimum and minimum—these two are the same—gives the measure of arterial wall tension or strain. This latter curve will be altered by early sclerosis, and should therefore provide a means of detecting early changes in the vessel wall. Plesch says that the tonoscillograph is easy to use, and he claims that with the use of this instrument it should be possible to get permanent accurate records of blood pressure. It is to be hoped that other investigators are confirming these results.

[1] THE LANCET, 1931, i., 71.
[2] Zeit. f. d. ges. exp. Med., 1931, lxxvi., 34 and 74.

ABNORMAL SPERMS AND DIMINISHED FERTILITY.

G. L. Moench and Helen Holt [1] point out that the problem of fertility has too often been attacked from its most abnormal aspect—namely, sterility. Lower fertility rather than absolute sterility is the common reason for an absence of children. The usual test of semen is, they think, inadequate; in other words, the presence of motile spermatozoa does not prove the fertility of the husband. For this purpose the form of the sperms must be considered and the number of abnormal must be assessed. From a series of cases which they have examined, they conclude that in a healthy semen the abnormal sperm-heads do not exceed 19–20 per cent. When the proportion is from 20–23 per cent. impaired fertility can be assumed, while if it is over 25 per cent. there is usually sterility. The kinds of abnormality that they found to be commonest they have classified under the following headings: head changes, abnormalities of the body, thickened and doubled bodies, coiled bodies and tails. In laying stress on these variations, they are advancing an opinion opposed to that held by such authorities as M. Huhner, who wrote "that if a sufficient number of normal actively motile sperms are present in a semen specimen, the presence of abnormal sperm-heads does not interfere with its potency." To this doctrine they are strongly opposed, holding that the sperm-head is the greatest single source of information as to the fitness of these cells for reproduction and that the relative number of abnormal sperm-heads is usually an index of reproductive fitness. The presence of abnormal types indicates a disturbance of spermatogenesis which affects all the sperm cells although it is visible only in those which are grossly deformed.

[1] Amer. Jour. Obst. and Gyn., August, 1931.

WELFARE PROBLEMS IN RURAL INDIA.

INDIA possesses some 750,000 villages, in which 90 per cent. of her total population live. While the last 20 years have seen the development of maternity and child welfare schemes in every province, these organisations are chiefly concentrated in large cities, no work on an extensive scale having been attempted in rural areas. In the book before us [2] Dr. A. P. Pillay sets out with commendable lucidity the main features of the problem of rural India, a problem complicated by the poverty of the villagers, their ignorance and illiteracy, caste fictions and factions, complete absence of sanitation, immense distances, and lack of railways or practicable roads. Maternity work is further hindered by the age-long traditions and fatalism of the hereditary dais, or midwives. These women, as Dr. Pillay says, "learn midwifery by precept or often only by instinct, and it is therefore not surprising that they practise the profession in all its historic impurity." Yet they cannot be ousted, and two chapters, by Mrs. D. Mitra and

[2] Welfare Problems in Rural India. By A. P. Pillay, O.B.E., M.B., B.S., with a foreword by Dr. J. Norman Walker. Bombay: D. B. Taraporevala, Sons and Co. 1931. Pp. 195. 8 rupees.

Miss R. Piggott, describe the efforts made to train classes of native dais in the Punjab and Hyderabad. Encouraging results have been obtained, but both writers emphasise the necessity for proper supervision, without which the standard of work is almost certain to collapse. Dr. Pillay regards an efficient service of doctors, nurses, and midwives as the essential basis for any scientific scheme of welfare work, and a section devoted to proposed improvement in training of medical students and midwives is packed with practical and carefully thought-out suggestions. The volume is a valuable contribution to the solution of the problem of rural India.

QUANTITATIVE ESTIMATION OF VITAMIN D BY RADIOGRAPHY.

THE variation of different rats' response to equal doses of vitamin D is as great as the variation of animal response to any other treatment. But Dr. Bourdillon and his co-workers [1] have now examined this variation and several factors which may influence it, and have worked out a method of estimating vitamin D for which they claim a degree of accuracy which has a "probable error" of about 8 per cent., while the largest error to be expected once in 22 such tests is +26 per cent. or —19 per cent.

A "scale of healing" has been drawn up in which are arranged the radiograms of the heads of the tibiæ of rats which have been rendered rachitic by feeding on a special diet and which then have been given different doses of vitamin D. The scale depicts a very severe degree of rickets at one end, a completely healed bone at the other, and ten successive degrees of healing between them. These stages are numbered 0–12. By reference to this scale the degree of healing shown in the radiogram of the tibia of any other animal may be assessed and given a numerical value. This makes it possible to average the different degrees of healing brought about in different animals by equal doses of the same substance. By the use of this scale, the vitamin D content of different preparations may be compared. Ten pairs of rats should be used in each comparison. Each pair of rats should be drawn from the same litter, and one of each pair should be given a particular dose of the one substance and the other of each pair a particular dose of the other substance. Thus ten animals would all receive the same dose of one substance and ten litter-mates would receive the other dose of the other substance. (The particular dose would be chosen according to the probable vitamin D content of the substance.) The results are assessed by reference to the scale, and each group is averaged. If the averages are equal, the doses chosen may be said to contain equal quantities of vitamin D. If not, then it is possible to make a calculation, from the figures found, to obtain the relative vitamin D content of the two doses. It has been found that about the middle of the range of healing (about 4–10 points) a difference of 2 points on the scale corresponds to a doubling of the dose of vitamin D. Thus, if the average degrees of healing were 5 and 7 respectively, the dose that brought about the average of 7 degrees of healing would contain twice as much vitamin D as the dose that brought 5 degrees of healing.

The report contains all the relevant practical details, and closely examines the possible sources of error. It lays emphasis on the importance of litter-mate comparisons and, for almost all purposes, the estimation of the vitamin D content of a substance in terms of a standard solution of reference. It is the work of an orderly and scholarly mind.

[1] Bourdillon, R. B., Bruce, H. M., Fischmann, C., and Webster, T. A.: Med. Research Council's Spec. Rep. Ser. No. 158. London: H.M. Stationery Office. 1931. 1s.

MEDICINE AND THE CHIROPODIST.

CHIROPODY is still, unhappily, associated in the medical and the public mind with hairdressing and manicure, but it is rapidly acquiring a higher status. The sixth annual convention of the Incorporated Society of Chiropodists, held at Harrogate from Sept. 24th to 26th, showed that the Society is anxious for closer coöperation with the medical profession. It wants so to win the confidence of the medical man that he will automatically seek the assistance of a qualified chiropodist wherever the condition of the feet is detrimental to the general health. It desires recognition in institutions, and the establishment of a chiropodial clinic in every large general hospital. No doubt such recognition has been delayed by the existence of large numbers of unskilled persons who claim to practise chiropody, and by the modesty of the Society concerning the qualifications of its members. All these must have attended a course at one of the Society's schools, and have passed a severe final examination. The course occupies a year and a half at the London school, or two years in Edinburgh and Manchester; it includes anatomy, physiology, pathology, materia medica, and therapeutics in their relation to the feet, and practical and theoretical chiropody. Many of the teachers have high medical or surgical qualifications, and the instruction and examinations are supervised at every turn by medical men. A member of the Society is therefore well qualified to give assistance to the medical profession. It is notorious that the feet of the public are almost as bad as its teeth, and much benefit would follow the enlistment of a skilled chiropodist in every suitable case. To give one example, mentioned by Mr. Norman Lake, the operation for hallux valgus would be far more successful if proper after-treatment by strapping and padding were applied as a routine. Many minor ailments of the foot, he admitted, are better treated by a chiropodist than by a doctor. The Society is still young, and only possesses slightly over 500 members; nevertheless, it has three schools and several foot hospitals and dispensaries, and a chiropodial department has recently been opened in the Royal Victoria and West Hants Hospital at Bournemouth. It is to be hoped that this example will speedily be followed by other hospitals. In earnest of its desire for coöperation the Society is steadily raising standards, both technical and ethical, and working hard to cultivate a medical outlook. The programme of the Convention included papers by six medical men. As its value becomes more widely known, the number of qualified members available —at present, as Dr. Maxwell Telling remarked, quite inadequate—should increase many times.

Dr. Alexander Hendry, surgeon apothecary to His Majesty's Household at Balmoral, has been promoted to a Knighthood in the Royal Victorian Order.

WE regret to record the death, at the age of 65, of Sir Gregory Foster, Bt., who was Provost of University College from 1907 to 1929, and Vice-Chancellor of the University of London from 1928 to 1930.

MODERN TECHNIQUE IN TREATMENT

A Series of Special Articles, contributed by invitation.

CCCXVIII.

THE TREATMENT OF ADVANCED PULMONARY TUBERCULOSIS.

PART I.*

THE treatment of dying consumptives is often said to be depressing because so little can be done for them; and it must be confessed that it is only too easy to lose interest in the treatment of incurable cases. It is, however, the function of medicine to relieve pain as well as to cure, and from my experience of treating nearly a thousand advanced cases of pulmonary tuberculosis (mostly among ex-Service men) I am convinced that life can be made reasonably tolerable for them and that terminal complications can be shorn of much of the pain and misery they bring with them.

The Psychological Aspect.—Nursing.

Before discussing the medicinal side of treatment, a word is necessary on the psychological aspect, for to ignore it will inevitably lead to failure. The "spes phthisica" is too well known to need emphasis; it is happily common, for it offers a valuable help in treatment. With a little care it can be kept alive and gently fanned, so that the patient remains more or less unaware of the hopelessness of his case. I have heard men speaking hopefully of the future within a very short time of death. These patients are not fools, but they are infinitely suggestible. Bound up with this hopefulness is the curious multiplicity of trivial symptoms that arise from day to day. Arising as a result of intense introspection, complaints of these symptoms are doubtless a reflection of an effort to leave no stone unturned that may lead to cure, and they may be partly due also to a desire to escape from the more pressing and constant features of the disease. Such complaints actually help the doctor. By treating all these trifling complaints seriously, he can give the patient greater confidence, the conviction that real interest is felt, and distraction from the hopelessness of his situation. I can recall the pleasure exhibited by many of these patients on some trivial cure of an equally trivial symptom. It is impossible, in fact, to exaggerate the importance of these seemingly futile attentions. The distraction of the patient's mind is indeed a prime necessity. The value of wireless, bedside industry, reading and writing, as stimulants to interest and as means of passing time, is very great. Bedside industry can be arranged at the patient's home as well as in institutions. Leather work, barbola and fancy goods, basket- and chair-making, rush-work, and rug-making form a nucleus to which other occupations can be added. Few of my patients had had any previous experience in this kind of work, yet much of what they did had real merit, and even the least accomplished got much pleasure from any interest shown in their efforts.

Nursing.—That the nursing of these cases can make or mar the treatment goes without saying. By a combination of efficiency, sympathy and understanding; by the strict enforcement of those regulations that are necessary in any tuberculosis ward, combined with a softening of the unavoidable restrictions of institutional life, the machine can be made to run smoothly. I am convinced that what success we have achieved has, in great part, been due to the nursing staff.

Dyspnœa.

One of the most distressing symptoms of these advanced cases is breathlessness. It causes extreme discomfort during the day and often insomnia at night. Whether one is dealing with the fibroid, the bronchitic and asthmatic, or the rapidly caseating types, two drugs stand out pre-eminently—ephedrine and adrenalin. Ephedrine is preferable, as it is more certain in action and more lasting in effect. The drug should be given by hypodermic injection where the dyspnœa is severe or occurs in attacks, as its action is much more rapid by this route. Even in doses of gr. ½ its effect will last from three to seven hours. It brings rapid relief and eases the cough. Hence, in cases of insomnia due to breathlessness and cough, a very useful combination last thing at night is ephedrine gr. ½ with a bromide mixture. I have known many patients to obtain five to six hours of peaceful and continuous sleep in this way. Should ephedrine fail, adrenalin in doses of ℥ x. can be tried, and will sometimes succeed, although its action is of shorter duration. The only drawback to ephedrine, in my experience, is that it may cause undue acceleration of the heart, but its advantages far outweigh this disadvantage. It is least successful in the rapidly caseating types. To patients with bubbling râles over the whole chest, injections of atropine gr. 1/100 give temporary relief.

Cough.

The management of cough is too large a subject to deal with here in detail. Its cause must first be determined and then treated. The dry useless cough, which may occur even in advanced cases, causing dyspnœa and exhaustion, can to some extent be controlled by the patient himself, and a timely warning as to its dangers is often an excellent deterrent. Inhalation of medicated vapours and, if they prove useless, ephedrine gr. ½, with the use of a sedative linctus (gargling the linctus before swallowing is often surprisingly helpful) will usually suffice. The cough with profuse expectoration is a much more difficult problem, indicating as it does extensive disease with breaking down of the tissues. Since the sputum must be brought up, sedative treatment is best avoided, except where the cough interferes with sleep or is so severe as to give the patient no rest. Even then the sedative linctus containing tinct. camph. co. or heroin should be reserved for the night in all but the most severe cases. Much can be done, however, with hot drinks night and morning, when the cough is likely to be most distressing and the sputum most profuse. These drinks, of which none is better than milk, tend to loosen secretion in the bronchial tubes, thereby stimulating rapid expectoration and shortening the attack. They have the added advantage in the morning of counteracting the feeling of exhaustion and at night of inducing sleep. A very useful prescription to help expectoration in the morning is:—

℞ Sod. bicarb. .. grs. xv. Spirt. chlorof. .. ℥ x.
Sod. chlor. .. grs. v. Aq. anisi ad .. ℥ ½
To be given with an equal quantity of warm water.

Laryngitis.

Of all the terminal complications of pulmonary tuberculosis, laryngitis is the most to be dreaded. Unremitting local and referred pain, the painful

* The second part of this article will appear next week.

swallowing, incessant coughing of frothy sputum, and insomnia will soon reduce all but the incurably optimistic and cheerful to a state of misery and dejection. Its only compensation is that it brings a moderately rapid death. That these patients waste and die rapidly is, I feel assured, due to the pain they suffer, since they often linger for a considerable time when kept on morphia and heroin.

In the early stages direct attack on the larynx with the cautery, and in the late stages the indirect method of nerve section or injection, offer perhaps the most rational line of treatment. My experience of these methods is very limited, but the preliminary results are hopeful. Silence is, of course, all-important, and is still the most useful treatment for all cases. Simple steam or benzoin inhalations are of great use to some patients, even if the disease is advanced. Inhalations appear to soothe the local condition, relieve the dryness, loosen any sticky secretion, and to some extent ease the pain. They are easy to give, and require no effort from the patient. Some patients, especially in the summer, derive considerable, although temporary, relief from taking ordinary ice-cream, and this is well worth a trial. Local applications or wrappings of the neck with thermogene wool may be of use, especially when there is much pain referred to the ear. Of local anæsthetics, a mixture of equal parts of orthoform, anæsthesin, and sacch. lact. is the best standby. It makes swallowing tolerable and dulls the pain for a longer time than do cocaine pastilles (menthol and cocaine āā gr. 1/20) or cocaine throat sprays (cocaine hydrochlor. ℥ i., glycerine ℥ iss, acid carbol. liq. ℥ ss, aq. ad ℥ xv.), which, however, are useful when the throat becomes exceedingly painful. When spraying is ordered it is wise to make certain that the nurse has been spraying the larynx and not the back of the throat, before abandoning the treatment as a failure. In spite of local treatment, the worst cases get little relief, and for them there is no point in withholding morphia and heroin.

RICHARD MASSINGHAM, M.R.C.S., L.R.C.P. Lond.,
Resident Medical Officer, Liverpool-road Hospital, London.

SPECIAL ARTICLES

ESTIMATION OF VITAMIN A IN BUTTER.

BY BARBARA G. E. MORGAN,

ASSISTANT IN THE NUTRITION DEPARTMENT OF THE PHARMACOLOGICAL LABORATORY, PHARMACEUTICAL SOCIETY OF GREAT BRITAIN;

AND

KATHARINE H. COWARD, D.Sc. LOND.,

BIOCHEMIST IN CHARGE OF THE DEPARTMENT.

A BIOLOGICAL method for comparing the vitamin A potency of different samples of cod-liver oil has recently been described by Coward, Key, Dyer, and Morgan (1930, 1931). The method was adopted by Coward, Dyer, Morton, and Gaddum (1931) for a comparison of the biological (vitamin A) value of a large number of oils and concentrates with certain chemical and physical measurements ascribed to vitamin A by various workers. The results described in that paper justified the claim made in the earlier one that by this method an estimation within ±30 per cent. of the true value of the vitamin A potency of an oil could usually be obtained by the use of 10 to 12 animals. The work described in the present paper indicates that the method can be applied to the estimation of the vitamin A potency of butters and margarines also.

Method.

The method of testing may be outlined as follows: Groups of about 30 rats, which had become steady in weight on a diet deficient in vitamin A, were given daily doses of a particular sample of cod-liver oil for five weeks, each rat of any one group being given the same dose. The doses of the respective groups ranged from 0·25 to 20 mg. The mean increase in weight of each group of rats in the five weeks was calculated and plotted against the dose of cod-liver oil given. In this way a curve of response was obtained. It proved to be a logarithmic curve, as was shown by the fact that, when the mean increases in weight of the groups were plotted against the logarithms of the doses given, the curve formed was a straight line. The curve relating response to dose of cod-liver oil was then found to be represented by the equation:—

$$y = 12{\cdot}1 + 40{\cdot}24 \log x$$

where x = the mean increase in weight of the group of rats in grammes,
and y = the dose of oil in mg.

This was later resolved into two curves, one for the bucks of the experiment and one for the does. The curves are:—

$$y = 11{\cdot}3 + 50{\cdot}3 \log x \text{ (bucks)}$$
$$\text{and } y = 12{\cdot}4 + 27{\cdot}4 \log x \text{ (does).}$$

Then, in order to find the vitamin A potency of a fresh sample of cod-liver oil in relation to that of the oil used in making the curve and now adopted as a standard of reference, a fresh group of about 12 rats prepared in the same way were all given the same daily dose, 1 or 2 mg. of the oil, for five weeks, and the mean increase in weight of the group was calculated. The dose of the standard oil which would bring about this mean increase was determined either by reading directly from the curve or by calculating from the equation of the curve. The ratio of the dose of standard oil to the dose of fresh oil is a measure of the vitamin A potency of the fresh oil in relation to that of the standard. Greater accuracy was obtained by calculating the response of the bucks and does separately, substituting in the respective equations and averaging the results. The accuracy obtainable by this method is considered fully in the papers to which reference has already been made. It appears to be well within ±30 per cent. of the true value.

In all the work on different samples of cod-liver oil and concentrates, the oil or concentrate was so dissolved in olive oil that the required daily dose was contained in 20 mg. of solution. The dose was given to each rat by letting fall one drop of solution from a dropping tube selected to deliver not less than 19 mg. and not more than 21 mg. in each drop. Thus each rat received the same weight of oil per day. Before accepting this method of comparison for butter and margarine, it was necessary to show that quantitative results could be obtained when different doses of vitamin A in different amounts of fat were tested; that is, for example, that the responses to some dose of butter and to a dose twice that amount

should be equivalent to the responses to some dose of cod-liver oil and to a dose twice that amount respectively, though in testing oils the different doses of vitamin A are contained in equal amounts of oil and in testing butters, the different amounts of vitamin A are contained in different amounts of fat. A comparison between fresh summer butter and one of the vitamin margarines regularly tested in these laboratories was extended to investigate this point. Doses of 0·05 and 0·1 g. respectively of both butter and the margarine ("Gold Chain") were tested by the method used in testing the cod-liver oils. The mean increases in weight in five weeks of the groups of rats (bucks and does separately) were calculated. The doses of the standard cod-liver oil which would have brought about these mean increases were calculated from the curves and these doses compared.

RESULTS.

The result is easily understood by reference to the following table :—

Table showing the Measurement of the Vitamin A Content of Different Doses of (a) *Butter, and* (b) *a Vitamin Margarine by referring to a Standard Sample of Cod-liver Oil.*

Dairy Butter bought July 3rd, 1930.

Dose (g.).	No. of ♂'s.	Mean increase in weight in five weeks (g.).	Dose of standard oil which would have brought about this increase (mg.).	No. of ♀'s.	Mean increase in weight in five weeks (g.).	Dose of standard oil which would have brought about this increase (mg.).	Average for bucks and does (mg.).
0·05	8	19·1	1·4	12	15·5	1·3	1·4
0·1	5	29·6	2·3	4	30·75	4·7	3·5
A Vitamin Margarine ("Gold Chain") bought July 1st, 1930.							
0·05	3	12·7	1·1	5	20·4	2·0	1·5
0·1	5	44·6	4·6	5	21·6	2·1	3·4

The doses of cod-liver oil which would have brought about the same mean increases in weight as 0·05 g. and 0·1 g. butter were 1·4 and 3·5 g. respectively.

The doses of cod-liver oil which would have brought about the same mean increases in weight as 0·05 g. and 0·1 g. margarine were 1·5 and 3·4 mg. respectively. The ratio of the doses of butter or of margarine was 1 : 2. The ratio of the doses of cod-liver oil corresponding to the doses of butter was 1 : 2·56. The ratio of the doses of cod-liver oil corresponding to the doses of margarine was 1 : 2·23. Thus the error of this determination on the butter may be said to be +28 per cent., and the error of the determination on the margarine may be said to be +12·5 per cent. These figures are well within the margin of experimental error of a biological determination.

Thus it would appear that within the limits of this experiment the method yields quantitative results even when the amounts of fat ingested with the vitamin are different. It emphasises the need for using about 10 to 12 rats in a group for any given dose of test material, for it is evident from a comparison of the results obtained from bucks and does separately on any given dose that small numbers of animals may give a result ±33 per cent. of the average, so that a single result on five animals might well have an error greater than this.

A further interesting comparison may be drawn between the butter and margarine. Both samples were bought in the open market. The manufacturers of the "Gold Chain" margarine claim for this, as for their other "vitamin margarines," a vitamin A potency equal to that of butter. It is obvious from the figures in the Table that their claim is justified. A dose of 0·05 g. butter proved to be equivalent to a dose of 0·05 g. margarine (measured as being equal to 1·4 and 1·5 mg. respectively of the standard sample of cod-liver oil), and a dose of 0·1 g. butter proved to be equivalent to a dose of 0·1 g. margarine (measured as 3·5 and 3·4 mg. respectively of the standard sample of cod-liver oil). Incidentally it is of interest also to note that the vitamin A potency of the sample of butter, and also of the sample of margarine, has about one-thirtieth (1·4/50, 3·5/100, 1·5/50, 3·4/100) the potency of the sample of cod-liver oil which was adopted in this laboratory as being an average medicinal cod-liver oil.

SUMMARY.

The method described by Coward, Key, Dyer, and Morgan (1930 and 1931), and Coward, Dyer, Morton, and Gaddum (1931) for the estimation of vitamin A in cod-liver oils has been shown to give consistent results also in the estimation of vitamin A in butters and margarines. This is of value, for the testing of different amounts of butter involves the giving of different amounts of fat, in addition to the fat-free diet employed in this method, whereas the testing of different doses of cod-liver oils has always been carried out by diluting, so that the required dose is contained in the same amount (19–21 mg.) of olive oil.

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Same authors: Ibid., 1931, xxv., 551.

MEDICINE AND THE LAW.

The War Office and Medical Records.

IN a recent case at the Central Criminal Court, mentioned in our columns last week, the learned Recorder criticised the War Office for not disclosing medical records. When the case was finally disposed of, a representative of the War Office attended the Court to give an explanation. The governing principle, he explained, was that official documents were privileged, the view being taken that soldiers should be encouraged to go to the medical officer without reports being used to their detriment. Each case was carefully considered and, if the Secretary of State for War felt that the interests of justice were paramount, the records were disclosed. In this particular case, when application was made, the War Office had thought that there was not sufficient information available to justify any departure from principle. After attention had been directed to the matter afresh by the Recorder's observations, the point was reconsidered and the information was now made available. It showed that the accused ex-officer had been wounded in the thigh in 1914 and severely wounded in the right arm in 1916.

From the statement of facts put forward by the prosecution the Recorder might well have supposed that the records would disclose evidence of shock or of a head wound; but there was no history of this. The incident was satisfactorily closed by the Recorder remarking that he quite understood the general policy of keeping medical documents confidential and that he was obliged to the Secretary of State for his courtesy in the matter.

THE NATURE OF VIRUSES.

It is this infinite invisible
Which we must learn to know and scorn.
—T. L. BEDDOES (1803–49), *poet and physiologist.*

ADDRESSING Middlesex Hospital students on Oct. 1st on "The Infinite Invisible in Medicine," Prof. James McIntosh spoke of the difficulty of conceiving that anything as small as ultramicroscopic bacteria or viruses could be alive. They are, he remarked, almost as infinitely small as the solar system is infinitely large. Their size approximates that of chemical molecules; the smallest known virus being about 20 micromillimetres in diameter, which is actually smaller than the molecule of (say) hæmoglobin with its 30 micromillimetres. The size of a molecule of ordinary protein is however much less than this and, small as they are, the smallest of these invisible microbes would still contain a score or more of protein molecules, a number which does not necessarily preclude a virus from being a living agent.

POSITION IN THE BIOLOGICAL SCALE.

The general consensus of opinion, he went on to say, is that they are alive and, if not actual bacteria, are closely related to them. The difficulty is that when the ordinary tests of bacterial life are applied to them, in most instances an unsatisfactory response is obtained. To begin with, these viruses cannot be directly seen by the ordinary microscope, although in fluid media their presence, if not their form, can be made apparent by the ultramicroscope. Even with this powerful apparatus the smallest viruses appear only as bright points of light, just as the remotest stars appear under the most powerful telescope. Again, cultivation on the artificial media used to grow ordinary bacteria has been so far a failure. Some of these viruses, that of small-pox in particular, can however be grown under the conditions which will allow of the multiplication of tissue cells known as tissue culture. Under such conditions and with living cells present, multiplication of the virus can be obtained in an indefinite series. It has been suggested that the presence of living cells in the cultures is necessary because these viruses actually live and multiply inside the living cells. In no instance as yet has it been possible to show that these viruses have a definite metabolism—e.g., respiration, &c.—comparable to ordinary bacteria. So far, the only real test of the presence of these invisible viruses is their power of multiplying in the animal tissues and producing disease.

The fact that these viruses can live only in close relationship with living cells of the animal body suggests that they are much more parasitic than ordinary bacteria; many appear to live actually inside cells. It is of course the exception for ordinary bacteria to do this; they live mainly on the juices of the tissues in the intercellular spaces. The few that are found inside tissue cells include some of the larger bacilli, such as leprosy, so that the intracellular life has nothing to do with the minute size of viruses.

THE BACTERIOPHAGE.

This close association with living cells is particularly well shown in the case of the bacteriophage, a supposed virus which lives on and attacks living bacteria, and about whose exact nature there has been, in recent years, a great deal of discussion. The bacteriophage will multiply only in living cultures of bacteria which it ultimately attacks, kills, and completely dissolves. In fact, if a little of this active agent be added to a thick and opaque culture of a suitable bacterium, it will dissolve the bacteria in a short time, leaving a clear fluid. It can also attack and completely dissolve thick opaque colonies of bacteria. The bacteriophage is exceedingly active, as often one-millionth of a cubic centimetre or less is sufficient to bring about the changes mentioned. This effect can be carried on indefinitely from one culture to another and this, said Prof. McIntosh, is adequate proof that the bacteriophage is a living agent. It thus causes a disease of bacteria, so that we may here quote with truth the old adage about great fleas having little fleas upon their backs to bite them.

INCLUSION BODIES.

Apparently many of the characteristic features of the diseases caused by these viruses, such as small-pox, measles, herpes, infantile paralysis, Rous chicken sarcoma, are the result of the close relationship between the virus and the cells. Further, the tissue cells which are attacked frequently show highly characteristic changes in their protoplasm, with the development of structures known as inclusion bodies. These peculiar bodies can be demonstrated by staining and are, in certain instances, colonies or aggregates of the virus. Thus we have Guarnieri bodies in small-pox, Negri bodies in rabies, polyhedral bodies in diseases of plants and insects, nuclear inclusions in herpes, chicken-pox and Borna disease of horses. But the study of these is really just in its infancy and we cannot say much about them at present.

There are, he went on, scientists who declare that these viruses are not alive, and that they are inanimate and of the nature of a ferment or enzyme, but a ferment cannot increase or multiply, and their only similarity is that they can both act in small or minute quantities. Others attempt to explain the regenerative or growth effects of these viruses by supposing that they are ferments which are regenerated in some way from the destroyed body cells or bacteria. They suggest that these viruses are produced from the protoplasm of the destroyed cell in much the same way as Charles Creighton suggested that visible bacteria were the result of the disease and not the cause. But the facts elicited in support of this view are not convincing.

In support of the contention that they are living agents, experimental work shows that the action or effect of physical agents, antiseptics, heat, drying, and radiation on these viruses approaches nearer to the effect on ordinary bacteria than to that on ferments. Again the invasion of the tissues during an attack of a disease such as small-pox leads to the appearance in the patient's blood of antibodies which are capable of destroying or neutralising the virus. No such bodies follow the injection of ferments.

CONCLUSION.

In the case of these viruses we have, said Prof. McIntosh, minute apparently living bodies capable of multiplying within the tissues where they call forth specific antibodies, yet so small that they contain only a few molecules of protein substance. Have we then in these viruses reached the limit of size in biology as the physicist with his atoms, electrons, and protons has done in the inanimate world? It would seem that we have almost done so, as it is inconceivable that a living particle could be less than a simple protein molecule. Perhaps, as Prof. A. E. Boycott has said, these viruses may be a transition between the living and the dead.

BRITISH ASSOCIATION.

CENTENARY MEETING IN LONDON.

ON Sept. 24th, in opening a discussion in Section I. on the

Physiological Basis of Sensation,

Prof. E. D. ADRIAN took up the view that the working of the sensory apparatus seems to depend on physical and chemical changes of fairly simple character. The events in the brain which cause sensation are still uncertain, but much is known of the kind of messages transcribed by a sensory nerve. They consist of a succession of impulses in the nerve-fibres, each impulse being a wave of activity of very brief duration, beginning as a breach in the surface, spreading quickly along the nerve, followed by recovery and by oxidation to make good the loss of energy. Study by amplification of the accompanying electrical disturbance shows that the frequency of the impulses varies from 20–100 per second, depending on the intensity and abruptness of the stimulus, but in any one fibre the impulses are all alike, and they are of the same general type in all nerve-fibres. The behaviour of sense-organs, notwithstanding their diversity in structure, is similar to that of nerves. There is no variation in intensity or form of their impulses, only in frequency.

Nerve-cells proper can, he said, do many things which their fibres cannot; they can remain in a state of activity for some time; they are suppressed or influenced to excitation by impulses reaching them from their fibres. Their active state probably consists of fairly simple physical and chemical changes. In the brain the individual cells are similar to those in the peripheral system. Then, the question arises, is a small group of cells responsible for a particular sensation, or is it the result of an elaborate pattern of excitation of the whole, lit up from the small group? There is much to say in support of the latter theory. Consciousness must be intact for anything to be felt, and the whole brain must be in working order for the maintenance of consciousness. Integrative action must be called in to relate the sensation to past experience. For example, in reading we glance at a few hints and the rest is supplied from past experience, from our childhood. The eye and the ear are the most used of our senses and hence are most related to experience. For this reason it is likely that they have an elaborate pattern in the brain. In the simpler and less meaning sensations such as touch and pain, there is less need for integration. Normally, messages from pain-endings are being damped down by impulses from other sense-organs, but if these stop the pain is felt.

Prof. FRANK ALLEN reported numerous experiments on sight, touch, hearing, and other senses, in order to demonstrate a mathematical relationship between the critical threshold of stimulation and the intensity of stimulation. Thus, the plotting of the critical speed of flicker against the logarithm of the intensity of light gives a straight line.

THE BASIS OF AWARENESS.

Dr. C. S. MYERS maintained that the knowledge derived from the study of the nerve-fibres and end-organs, of the message sent to the brain is only an insignificant addition to the understanding of the kind of process that goes on in the brain, the basis of awareness, the consciousness of sensation. At present we are almost wholly ignorant of what occurs in the more important sensory centres of the brain. Although these higher sensory centres are essential for sensation they are not to be regarded as the seats of sensation. For instance, if certain nervous impulses must be transmitted through the occipital visual centre it does not follow that the centre is the seat of visual sensation. Sensation depends on the relation of the activity of the sensory centres to the vast integration of the central nervous process on which self-activity in turn depends. Where no self-activity is involved there can be no consciousness of sensation. The infant does not first receive a multitude of discrete sensations and combine them together into the perception of an object. Sensory consciousness is not the function of the primitive mind. The infant initially receives only vague impressions of situations, and only by experience does he come to differentiate and to appreciate the simpler sensations. The biological function served by the consciousness of sensation is the control of its specific efferent responses by the organism. Sensations have become differentiated from one another because the response is different for each. When the patterns of response for two different stimuli are too nearly identical, the respective sensations are indistinguishable; just distinguishable (or just indistinguishable) differences in sensation do not necessarily imply the activity of the same (or different) end-organs.

SENSORY DISCRIMINATION AND THE EYE.

Sir J. HERBERT PARSONS said that in the study of the changes of potential in afferent nerves, the conditions are rendered as simple as possible and the variables are reduced to a minimum. To use these results for the interpretation of the experiences of the intact animal, they must be correlated with facts derived from other sources. The term sensation implies a conscious or psychological response, which is only fully known to the individual who experiences it, but speech enables human beings to make comparisons. The consciousness of lower animals can only be inferred from their behaviour. Hence the uncertainty of deductions made from them, but these can be corroborated by anatomical studies on the assumption that function is dependent on structure. Head's dual system, an analysis of sensation into the cruder, more primitive, or protopathic, and the higher, discriminative, or epicritic types, has thus been confirmed, not only for tactile sensations, but also for the special senses. Even those neurologists who refuse to admit Head's views must accept the broad structural and functional facts which prove the optic thalamus and its connexions to be a great lower level sensory system subserving the grosser and less discriminative sensory phenomenon, distinct from the apparatus of the higher sensory discrimination, wherever they may choose to put the latter. Phylogenetic study may also reveal variations in sensory capacity at present unrecognised in species where adaptation to special environments has occurred. It is attractive, for example, to think with Hess that all fish are colour-blind, and that the colour vision of birds is very inferior to ours. It is quite likely that both statements are true, but it is certain that the phylogenetic status of an animal is a poor indication of its various sensory attainments. The retinæ of birds and reptiles, for example, contain coloured oil globules, affording strong evidence that their vision has evolved along lines different from ours. In man, hearing is the sublimation of the appreciation of mechanical stimuli and the allied functions which, in fish, are represented by the lateral line organs are lost. Smell in us is reduced to a minimum and has been replaced

by the pre-eminence of vision. Vision is the sense which provides the most delicate form of sensory discrimination which man, and presumably any animal, has yet attained.

Although there is strong evidence of representation of complex phenomenon of perception in the peripheral mechanism and lower neural centres in the eye, much remains unexplained. For instance, it is not known why a presentation which arouses a given pattern by direct visual fixation arouses the same pattern when it falls upon the peripheral retina, even in spite of differences of size, intensity, and colour. A circle remains a circle when viewed obliquely though the retinal image is now an ellipse. In the present state of knowledge the explanation must be sought from psychological factors, the physiological bases of which are unknown. One such is attention upon which the configuration and significance of a perceptual pattern must depend. Attention sensitises the formative zone with the result that the impulses are correlated into a pattern which arouses a definite perceptual pattern—a percept of the higher order. On subsequent occasions the impact of the excitation arouses a more and more highly developed pattern as a primary response and in instinctive reactions this occurs upon the first occasion owing to the innate configuration of the formative zone.

Prof. H. E. ROAF reported an experiment which showed that there is an overlap in "the common end-point" of the two eyes in the brain.

TEN DISTINCT SKIN SENSE-ORGANS.

Dr. R. S. CREED suggested two points to be elucidated: first, the mechanism of the ten distinct skin sense-organs. Of these we have merely a slight knowledge of the pacinian corpuscles—namely, that deformation is an adequate stimulus to it. We are still in doubt as to the sensation evoked; it is even possible that it is concerned with reflexes and not with sensation at all, since these bodies are also found in abdominal viscera. The precise organs for response to heat and cold are unknown and exhaustive search often reveals no nerve-endings. What are the end-organs of the sense of position? Secondly, little is known of the changes that an impulse may undergo at the many relays in the efferent system. Some integration occurs below the level of the sensorium.

Prof. H. HARTRIDGE criticised the classroom analogy of the sensory system to that of the telephone, since it takes no account of memory.

Sir EDWARD SHARPEY SCHAFER pointed out that it is hard to accept Head's dual system for three reasons: First, his own experience from section of two cutaneous nerves in his arm does not uphold Head's work. Secondly, Trotter, from his study of numerous cases has obtained diametrically opposite results. Thirdly, pain is a sensation of higher rather than lower animals, so that the idea that protopathic sensation is more primitive is undermined by fact.

Prof. D. W. BRONK laid stress on the importance of correlating the intensity of the stimulus to the sensation. Prof. Adrian's work has shown that the frequency of impulses falls off after repetition of the stimulus. In a comparable way, on the motor side, the discharge of stimuli become more frequent with the greater call to activity; this has been observed in the phrenic nerve during asphyxia.

Dr. E. P. POULTON showed tracings taken from a manometer connected to an inflated bag placed in the alimentary canal of patients and healthy individuals. Pain occurred when the gut wall was stretched and it was relieved when the lumen was reduced either by the muscular contraction of organ or by deflation of the bag. If the bag did not yield to the muscular contraction the pain persisted. His tracings also showed that stimulation of an area of refined pain altered the rhythm and extent of the contraction of the viscus.

Prof. H. H. WOOLLARD said that the nerves of the protopathic areas showed a characteristic anatomy: a thick fibre with multiform uniform endings accompanied by a very fine fibre with a diffuse ending. These nerves are found in the glans, the mammary gland, parietal peritoneum, and in muscles.

Sir CHARLES SHERRINGTON said that the time relations are of great use in the study of the occurrences between initial stimulus and conscious sensation.

Prof. ADRIAN summed up by saying that we are very ignorant of the confines between physiology and psychology. It is just assumed that sensations develop during childhood and that, as we grow up, they are differentiated from the complex mass received.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

THE TYPHUS-LIKE DISEASES.

A PROMISING field of investigation has been found in the typhus-like diseases of this continent. These include Brill's disease, or the endemic typhus of the Eastern and Southern States; Rocky Mountain fever, which now appears to be endemic in the East as well as in the Mountain States, and tabardillo, or Mexican typhus, which may or may not date from the Spanish conquest. Between European typhus and the endemic typhus of Eastern States there has been established complete cross immunity. Epidemiological evidence suggests the rat-flea as the source of Brill's disease and the rat as a reservoir of infection. The rat mite (*Liponyssus bacoti*) must also be considered a possible vector. However, the recent discovery of typhus virus present in nature in the flea [1] is of significance when coupled with epidemiological evidence.

Cross immunity is not found between Rocky Mountain spotted fever and endemic typhus (Brill's disease), but it is well marked between the strains of spotted fever virus obtained from the Rocky Mountains and from Eastern States.[2] In each case the vector seems to be a tick. The dog tick (*Dermacentor variabilis*) is incriminated in the East, and in the West the wood tick (*D. andersoni*), which, besides spotted fever, also carries the virus of tick paralysis, Colorado tick fever, and tularæmia. The rabbit tick (*Hæmaphysalis leporis-palustris*) conveys spotted fever from rabbit to rabbit, but does not infest man. Its rôle in maintaining a reservoir of infection will be a part of the investigation to be undertaken in the laboratory in Hamilton, which this year has been acquired by Congress from the State of Montana for the U.S. public health service. A total appropriation of $150,000 was made, and half of this will be available for enlargements and improvement of the facilities. The demand for tick vaccine has been increasing; some 20,000 people have been vaccinated in the Mountain States during the last four years. For this and for research purposes about 200,000 infected ticks are reared each year.

[1] Dyer, R. E., Rumreich, A. S., and Badger, L. F.: U.S. Pub. Health Rep., 1931, xlvi., 334; also Kemp, H. A.: Jour. Amer. Med. Assoc., Sept. 12th, p. 775.

[2] Dyer, R. E., Rumreich, A. S., and Badger, L. F.: Jour. Amer. Med. Assoc., August 29th, p. 589.

Much work remains to be done on all these diseases, and especially on tabardillo. The infectious agent has recently been found [3] in the brains of rats (*Mus rattus*) in Mexico City. Whether fleas, mites, ticks, or bed-bugs convey the disease from rats to men has not yet been determined. Zinsser favours the bed-bug. He points out that in Vera Cruz, where the climate is tropical and ideal for flea life, typhus is quite rare, whereas in Mexico City, 7300 feet higher, fleas have less congenial environment than the more hardy bed-bug. In Mexico City there are epidemics of typhus every year. Moreover, he says, the bed-bug will "bite anybody and anything under any circumstances." With Dr. Castaneda, he has kept the virus of typhus alive by rectal injection and by feeding of bed-bugs on typhus rats. It should be possible by animal experimentation to discover whether the bed-bug can reconvey infection to the animal it bites. In the last analysis it will be epidemiological research which determines which vector is of the greatest practical importance. One waits also for cross immunity experiments with the virus of tabardillo against the virus of the other two typhus-like diseases.

NOTES FROM INDIA.

(FROM OUR OWN CORRESPONDENT.)

Health of British Troops.

THE Public Health Commissioner tells us [4] that in a year in which the average strength of British other ranks was 55,628, and that of officers 2395, the rates per 1000 of admissions to hospital were 609·5 and 415·9, while deaths amounted to 2·84 and 7·10 respectively. This striking difference in the mortality figures between officers and men is accounted for by the fact that of the total of 17 deaths of officers, 8 were due to injury, but it is nevertheless true that over a period of ten years the average mortality of officers has exceeded that of other ranks, the figures being 5·49 and 3·29 respectively. No particular reason is assigned for this excess. Thirty or forty years ago it might have been attributed in great part to the difference in housing. At that time, while the men were generally housed in fine stone barracks, with good sanitary arrangements and careful supervision of the kitchens, it was no uncommon thing to find their officers living in thatched bungalows, the floors of which were made of mud, liberally smeared with cow-dung, while the kitchens and sanitary arrangements were often filthy, fly-ridden, and uncared for. No doubt there is still a balance well on the credit side for the men, but the conditions for officers are now very much improved, and it is to be hoped there is some other explanation for the discrepancy, such as that of this year, which evidently exists.

CHIEF CAUSES OF INVALIDITY.

For other ranks the year was a normally healthy one. The principal causes of admission to hospital were malaria, local injuries, minor septic diseases, venereal diseases, sandfly fever, tonsillitis, dysentery, and bronchitis, in order of frequency. Of these, malaria, sandfly fever, diarrhœa, dysentery, and tonsillitis all showed a definite increase. There was a decrease in venereal diseases, which were 206 less than in the previous year, at 2552. The total of 158 deaths, or 2·84 per 1000 of the strength, compares with 2·95 per 1000 in 1928, and 3·34 in 1913. The most important causes of deaths were local injuries, the enteric group of fevers, and pneumonia. Appendicitis accounted for 9, drowning for 8, and suicide for 6. It would be interesting to have a comparative statement for the last item over a period of years. No doubt present conditions in India are productive of considerable strain for the Army. The average number constantly sick in hospital was 30·44 per 1000 of the strength, as compared with 29·04 in 1928, 29·18 in 1927, and 29·68 in 1913. Out-patients averaged 19·88 per 1000. The figures for invaliding are much the same as those of the previous year—9·78 per 1000 of the strength, as compared with 9·87 for 1928, and 7·49 in 1913. Of the total 544, 57 were invalided for tuberculosis, 52 for diseases of the middle ear, 52 for mental diseases, 36 for disordered action of the heart, and 28 for epilepsy.

THE REVIVAL OF "P.U.O."

The enteric group of fevers shows a considerable increase at 233, as compared with 197 in the previous year, though deaths are not a large item in the mortality list (19 as contrasted with 18). As the incidence and nature of these fevers amongst British troops is closely related to that amongst Indian troops, they have been tabulated and analysed together. The increase in the former has been largely due to typhoid, while in the latter it has been due to both typhoid and paratyphoid A and C infections. Under the present regulations a case may only be diagnosed as typhoid or paratyphoid if the infecting bacillus has been isolated. Cases in which there has only been demonstrated a definite rise in the curve of agglutination by the Widal test, or which have been merely clinically diagnosed enteric, are classified as "enteric group." It is recognised in a D.M.S. circular of the year that there is still a considerable use for the heading "P.U.O.," in spite of increased facilities for diagnosis, and this heading, which has sometimes been looked on as a refuge for slackness, seems to have returned to favour. The circular justly remarks, after laying stress on the necessity for accurate diagnosis where possible, that there is still, in all probability, a large group of fevers which are not recognisable by existing methods, and that these can properly be entered as P.U.O. It is clear that increased interest is all the time being displayed in laboratory investigations, and this section of the report well repays attention

MALARIA, SMALL-POX, DYSENTERY.

As regards malaria, the admission-rate has fallen steadily for the past five years. During the year under review it rose somewhat, but the rise was almost entirely due to an outbreak of malignant tertian in the North-West Frontier Province and Northern Punjab. Plasmoquine was under trial in some of the larger hospitals, and is reported on favourably. Malaria surveys were carried out during 1929 in a number of the most malarious stations, in amplification of similar work done in former years, and operations based on these surveys have been started. Anti-mosquito measures, which in normal years have proved very effective, apparently failed this year in checking the onset of epidemic malaria in Northern India. Small-pox has been conspicuous by its absence; only four cases occurred during the year. This should serve as a useful object lesson to those who are clamouring for relaxation of vaccination throughout India. Dysentery, which accounted for 1039 admissions, is still attracting much attention. Material from the stools of 4235 cases reported as

[3] Mooser, H., Castaneda, M. R., and Zinsser, H.: Ibid., July 25th, p. 231.
[4] Annual Report of the Public Health Commissioner with the Government of India for 1929, Vol. II.

suffering from this disease was examined in the military laboratories, and typical bacillary exudate was found in 2286. In 1329 of these dysenteric bacilli of one or other kind were found. As contrasted with this, vegetative *E. histolytica* was observed in 296 cases. The results from all workers in the military laboratories, over a long period, show that the relative proportion of bacillary and amœbic dysentery is roughly from 80–90 per cent. bacillary to 10–20 per cent. amœbic. All the same, it is suggested that the tendency in favour of a diagnosis of bacillary as opposed to amœbic infection may have gone too far, and that amœbic cases are probably being missed. The vexed question of carriers of amœbic dysentery is discussed at some length. It appears that too much stress may have been laid on the danger of infection from cooks and other menials employed with troops, and that the existing regulations, under which any found to be suffering from amœbiasis must be discharged, are perhaps unnecessarily harsh.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

PAYMENT OF INSURANCE PRACTITIONERS.

AN agreement has been made between the Association of Krankenkassen (sick-clubs) and the Hartmann-Bund by which the fees paid by the clubs are to be reduced by 10–20 per cent., according to the amount paid in the different districts. The agreement is only provisional, and is to be replaced by a definitive one. The clubs are compelled to reduce the fees by their bad financial condition, which is due to unemployment of the workers and insolvency among the employers. The above agreement was made to avoid measures by the Government under the Emergency Act, by which the fees might perhaps have been reduced still more.

The Association has recently published a statistical record for the year 1930 of the income of medical men engaged in club practice. Some 29,000 are included in the figures, and it appears that 42 per cent. of them earned less than M.2000, 28 per cent. from M.2000 to M.6000, 20 per cent. from M.6000 to M.12,000, and 9 per cent. from M.12,000 to M.25,000; while 190 doctors received from M.25,000 to M.35,000, 50 from M.35,000 to M.55,000, 9 from M.55,000 to M.75,000, and 4 from M.75,000 to M.100,000. The four last categories, earning more than M.25,000, include only 0·8 per cent. of the total. The great majority of insurance practitioners are far from earning a good income from club practice, for nearly half of them receive less than M.2000.

OPENINGS FOR GERMAN PRACTITIONERS ABROAD.

Dr. Schopohl, director of the Prussian Medical Department, has edited a compilation of the laws and regulations concerning medical and dental practice in Europe, Asia, Africa, America, and Australia. The book is written for the use of German medical men intending to settle abroad, and Dr. Schopohl was assisted in his work by the German Foreign Office, which instructed the German diplomatic representatives to answer his questionaire. The difficulty of his task, however, is shown by the fact, for instance, that each of the 49 United States of America has regulations of its own which have to be described at full length in the book. The work deals with the study and the examinations abroad; with the question whether German examinations are recognised without or with an additional examination; and whether a German medical man must go through the whole curriculum and pass all the examinations. German diplomas are not recognised anywhere without at least an additional examination; nearly everywhere a qualification is granted only if all the examinations have been passed, and sometimes practice is even then allowed only on naturalisation. For some countries there are treaties of reciprocity—e.g., between England and Italy—but there is no treaty between Germany and any other State, except for practice in the frontier districts. Dr. Schopohl advises medical men intending to settle in East Asia to apply first for an appointment as a ship's medical officer on a German liner so as to become acquainted with the country and to inquire on the spot into the chance of a settlement; nearly all the medical men residing in the ports of East Asia have previously been ship's doctors. Generally speaking there is very little chance for a German medical man to settle abroad; the profession being everywhere overcrowded, the settlement of foreigners has everywhere been made very difficult, and in some places impossible.

PETROL AND THROMBOSIS.

Thrombosis and embolism have much increased of late in nearly every civilised country, but the cause of this surprising increase is not yet apparent. Food, intravenous therapy, and influenza have all been blamed, and now Prof. Erwin Payr, of Leipzig, suggests that petrol and benzol used by motor-cars may be partly responsible, an idea which occurred to him because the incidence of thrombosis is relatively greater in large cities than elsewhere. Dr. Kuntzen, of Leipzig, has now made experiments on animals to study the influence of exhaust gas on the blood. He shut rabbits and rats in cages to which a mixture of benzine and petrol vapours was introduced for 20–30 minutes daily, and he found that the thrombocytes in the blood of those animals much increased. He then injected three to four drops of varicophytin, a compound used for the treatment of varices by obliteration, and observed that the blood of animals which had inhaled the gas coagulated much quicker than that of other animals.

INJURIES OF THE RECTUM BY THERMOMETERS.

Dr. Siebner, of Stuttgart, reports six cases in which the wall of the rectum has been damaged by insertion of thermometers. The accidents are usually caused by the patients themselves, who take their temperatures because they are worried about illness. Soon after introduction of the thermometer there is tenesmus with hæmorrhage. The injury is always on the anterior wall, some 5 cm. above the anus.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

A NURSES' PENSION FUND.

ABOUT a year ago the Irish Nurses' Union inaugurated a pension fund for nurses, on a purely contributory basis. The subscription asked for was the small sum of 5*s.* a year, but, in spite of this small demand, only 431 nurses and midwives joined the scheme. Attempts are being made to establish the fund on a wider basis, and a public meeting was held last week in the Mansion House, Dublin, for this purpose. The Lord Mayor presided, and speeches were made by well-known medical men and other

(*Continued at foot of opposite page.*)

PUBLIC HEALTH SERVICES

ANNUAL REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are 1930 statistics of two county boroughs and a city :—

Name of district and estimated mid-year population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant and neonatal mortality.	Young child (1–5 yr.) mortality.	Maternal mortality in childbirth.
Croydon .. (222,300)*	15·8	10·5	0·79	1·52	1·6	1·7	48	23	14	2·0
Brighton .. (146,800)*	13·5	13·0	0·91	1·70	1·2	2·6	51	20	28	3·5
Norwich .. (124,900)*	15·7	10·9	0·72	1·74	1·3	1·9	45	22	23	4·9

* These are the 1929 estimates and may be compared with the 1931 Census figures—viz., 233,115, 147,427, 126,207.

Registered stillbirths per 100 live births: Croydon, 3·0; Brighton, 3·8; Norwich, 4·2.

Croydon.

Dr. Oscar M. Holden says that under the Local Government Act the health committee has become responsible for all maternity and tuberculosis work, and the mental deficiency committee for mental defectives—Croydon's hospitals are overtaxed. The Mayday Road (poor-law) Hospital could not be appropriated at once by the health committee. It contains 465 beds, 64 of which are allotted to tuberculosis, 20 to maternity, and 64 to mental cases, and over 100 beds are occupied by Surrey county patients, so that many adjustments have to be made, and also the buildings need modernising before it can function satisfactorily as a general hospital. The floor space in the wards is inadequate, and in remedying this, 72 beds will be lost. It is proposed to increase the beds to 800 ultimately. The Croydon General Hospital has 130 beds, and plans are in hand for the addition of 61. Dr. Holden says the number of contacts examined at the dispensary is increasing, but is still far too small. The erection of glass partitions between every two beds at Cheam sanatorium has been appreciated as giving greater privacy. An X ray plant is to be installed which will enable artificial pneumothorax to be carried out. The occupation centre has been transferred to a new building, enabling a greater variety of work to be done under excellent conditions. This work increases steadily in volume, and the patients after they go home keep it up, and either find a market for their finished articles or sell them through the agency of the sanatorium.

The chief event in the maternity and child welfare work was the extension of St. Mary's Hospital, conducted by the Croydon Mothers' and Infants' Welfare Association. This hospital now provides 32 maternity beds, 30 of which are reserved for council cases. The voluntary societies have not suffered financially from the introduction of block grants, and their work is now more closely linked up with the official public health work, to the mutual benefit of both parties. A useful step towards coördination has been made by the appointment of a whole-time obstetrician, who lives at Mayday Road Hospital and is responsible for the maternity and gynæcological work at that institution. He is also in clinical charge of the antenatal and postnatal centres, and attends daily at St. Mary's Hospital, where the confinements are conducted by the midwives on the staff, and a rota of six general medical practitioners. In November a convalescent home for infants and children up to the age of 14 was established. The observation nursery has proved a useful unit, and may ultimately be transferred to Mayday Road Hospital, thus vacating accommodation much needed for the maternity and school clinics. The need of suitable accommodation for the mentally deficient is not likely to be eased for the next two or three years until the county council have altered poor-law institutions for the purpose of making joint provision for the county and borough. The orthopædic work continues to expand, and gross deformities are far less frequently encountered than formerly. A remedial exercises clinic, conducted by a whole-time remedial gymnast on the council's staff, works in collaboration with the orthopædic surgeon.

Dr. Holden mentions that the consumer naturally concludes that grade A is the highest standard of milk, whereas it is the least safe of the designated milks. A well-equipped dairy for the pasteurisation and distribution of milk was established during the year, and Dr. Holden suggests that the wider use of pasteurised milk has played an undoubted part in the decline of non-pulmonary tuberculosis. This decline is more noticeable than that of the pulmonary disease.

Brighton.

Dr. Duncan Forbes gives a plan of the poor-law institution, which is of the mixed type (providing for chronic senile cases, mental cases, and able-bodied men), and administered by the public assistance committee. The sick wards, which constitute a fully equipped general hospital, include 710 beds (of which 541 were occupied at the end of the year), and serve to relieve the Royal Sussex County Hospital, which always has a long waiting list. Treatment by artificial pneumothorax continues to grow, and refills are provided for patients whose treatment began elsewhere. The refills given to out-patients at the dispensary numbered 64, and at the sanatorium 109. Up to the end of 1930, sections of the livers of 237 stillbirths have been examined, of which 13, or 5·5 per cent., showed spirochætes. On the subject of measles contacts Dr. Forbes concludes that the main object should be to protect children under 5, and if possible to delay epidemics until the summer. When measles is about, children under 5 should be excluded from school and creches, and Sunday schools should be closed, as also cinemas to children. School closure should not be practised in the warm months, but may be desirable in the winter in order to delay the epidemic. No cause was discovered for an outbreak of paratyphoid B, affecting 11 rescue girls at St. Mary's Home, Rottingdean. In nine cases the

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(*Continued from previous page.*)

citizens. Some speakers suggested the possibility of obtaining funds from public sweepstakes, while others stressed the danger to the economic independence of nurses should they become dependent on sources of emolument other than the results of their own work.

DUBLIN HOUSING.

The Corporation of Dublin has decided to float a loan of £1,000,000 to be applied to improving the housing conditions of the city. The Irish banks have underwritten the loan, which is to bear 4½ per cent. interest, and will be issued at 95. The Corporation is to be congratulated on the good terms it has got, which, indeed, speak highly for the credit of the city. It is hoped that the project now to be set on foot may better finally the age-long problem of the Dublin slums.

onset was between Oct. 24th and 31st, and two additional cases occurred on Nov. 5th and 6th. All the girls were inoculated, and the new admissions after Dec. 5th remained well. Two outbreaks of milk-borne scarlet fever came to light. One arose from a dairy outside Brighton. Seven of the 50 cases notified were Brighton residents, of whom one died. This outbreak was probably due to the infected throat of a dairy worker. A general practitioner telephoned that he had diagnosed scarlet fever in the son of a dairyman. The next delivery of milk was pasteurised, and this second small outbreak was limited to five cases of scarlet fever and one of sore-throat. In the spring there were 34 milk-borne cases in a neighbouring town. Some of the incriminated milk came to a large dairy in Brighton, where all the milk is pasteurised. No one in Brighton was infected by this-milk supply.

Dr. J. S. Harper gives particulars of 66 cases of puerperal fever treated at the sanatorium between January, 1928, and April, 1931. There were 28 cases of simple uterine infection with no deaths; 22 cases of uterine and pelvic infection with two deaths; and 16 cases of general infection with five deaths. Out of 34 (1930–31) cases, in eight forceps were used, and in six the placenta had been removed manually. All the cases were treated by intra-uterine glycerin douches. The cases treated by special drugs were too few to give conclusions as to value, but in none were the results dramatic. In all early cases anti-streptococcal serum was used.

Dr. G. H. Harper-Smith reports on the clinic for mental disorders opened in January, 1926. This clinic has been attended by 459 patients, of whom only 21 have been certified, and there is a suggestive decrease in the number of patients certified from Brighton during the year 1930 as compared with 1929.

Norwich.

Dr. V. F. Soothill says that the public assistance infirmary is in a very unsatisfactory state. The buildings are intermingled with the workhouse, and are out of date and inadequate. The health committee is considering the desirability of the establishment of a municipal hospital on a separate site. The city maternity home has 15 beds and a staff of seven midwives, of whom some work on the district. During 1930, 308 women were confined in the home and 205 were attended on the district. The public assistance infirmary also deals with normal and abnormal confinements, and the Norfolk and Norwich Hospital with abnormal only. The city mental hospital, with nominal accommodation for 476 patients, admits 543, whilst the public assistance infirmary has beds for 120 mental cases. On Sept. 1st the council opened an institution for female mental defectives, and the public assistance infirmary is approved for the reception of six male and 20 female adult defectives. Until the council has decided the future of the public assistance institution, the question of more intimate coöperation with the voluntary hospitals will have to remain in abeyance. In the meantime there is a demand for more hospital beds for surgical tuberculosis, orthopædic work, and rheumatism. About half the admissions to the voluntary hospitals are from outside the city.

Housing conditions are slowly improving. The municipal houses built during 1930 numbered 315, whilst 45 closing orders were made and 11 houses were demolished. The five-year programme provides 300 houses per year for new housing, and 250 to rehouse the tenants from condemned houses or slums. This scheme, when completed, will, says Dr. Soothill, still leave a good deal of clearance to be done in later years, seeing that insanitary areas represented under the 1925 Housing Act have not been dealt with. Cases of overcrowding are continually brought to the notice of the health department, and during 1930 81 such cases were passed on to the housing committee as applications for municipal houses. In order to secure a prompter remedy, the housing committee has agreed to allocate to the health committee 35 houses for persons in unhealthy or overcrowded houses unable to obtain a corporation house under the regulations of the housing committee. At the end of the year, 11 of these houses were occupied, and it is intended that the health committee shall have, from time to time, at its disposal a number of houses to be used for urgent health purposes. Cellar dwellings have been done away with, and Dr. Soothill thinks the limitation of basement work-places should be taken in hand.

Early in 1927 one of the 29 midwives practising in the city was suspended as a carrier of hæmolytic streptococci. Her claim for compensation was finally settled in 1930 by the payment of a further sum of £250. Another midwife was suspended in March, 1929, for the same reason; the suspension being removed in January, 1930, after three negative swabs had been taken from her throat. One of the municipal midwives was also suspended from July until August for the same reason. Diphtheria was less prevalent. There were 118 cases with seven deaths. Of the six children who died, five were attending one school. Of 13 cases of paratyphoid fever, eight occurred in one institution about the same time, but no cause was assigned for this outbreak.

MENTAL HOSPITAL REPORTS.

THERE were 893 patients in the BRIGHTON COUNTY BOROUGH MENTAL HOSPITAL at HAYWARDS HEATH on the last day of last year. Most unfortunately it has been necessary to receive a number of imbecile children into this institution, as the contract for keeping them at Hellingly has expired and no other accommodation is available. The death-rate for the year was 9·17 per cent. and the recovery-rate 35·67 per cent. The general health was good; eight patients were notified as suffering from tuberculosis and seven men had erysipelas, but there was no epidemic disease. Eight patients suffering from general paralysis were sent to Hellingly for malarial treatment: one died and, of the four returned to Haywards Heath, one has been discharged. On an average there have been 17 men and 14 women on full parole and 56 men on parole within the grounds; 13 men and 16 women have had short leave of absence and many more have had day outings with friends or members of the staff. The hospital now has three social workers who do excellent work among the patients and their friends. Sketch plans for an admission hospital have been passed. The out-patient department at Brighton, which opened in January, 1926, has now seen 459 cases, 107 new ones having attended during last year The medical superintendent of the hospital has been appointed honorary physician on the staff of the Royal Sussex County Hospital and sees patients there once a week. The dentist attended 824 patients during the year. Forty-nine men and 38 women of the staff of 153 are certificated or registered as mental nurses.

The CITY OF BIRMINGHAM had 2310 patients in its mental hospitals on March 31st last. The death-rate for the year was 5·4 per cent. At WINSON GREEN there were 771 patients on the last day of 1930, and the recovery-rate was 45·65 per cent. and the death-rate 4·91 per cent.—the lowest in the history of the hospital. Post-mortem examinations were made in 91 per cent. of the deaths. The general health was very satisfactory; there was a mild epidemic of dysentery affecting five patients, while 10 patients suffered from erysipelas and one attendant from diphtheria. Four patients suffered from tuberculosis. As is the custom in the Birmingham hospitals, patients were examined by the visiting ear, nose, and throat specialist, and a large proportion of them were found to be suffering from septic tonsils or chronic nasal sinusitis; a number of operations were performed, with encouraging results. The visiting gynæcologist examined 85 women and the visiting dentist saw all new cases. The visiting surgeon performed five major operations. Six men

and three women were treated by induced malaria and 14 men and one woman by intramuscular injections of colloidal sulphur. No benefit was found after sulphur in dementia præcox, and it is yet too early to estimate its effects in general paralysis. The results of early ultra-violet ray treatment were disappointing. Parole was granted to as many patients as possible, and over 65 per cent. were kept usefully employed, mostly in the grounds, wards, or hospital services. Of the nursing staff 67·6 per cent. now hold the R.M.P.A. certificate. The adjoining fever hospital with grounds of 7¾ acres was taken over by the Mental Hospitals' Committee towards the end of last year. The nurses' home there will provide accommodation for 100 nurses and the five detached blocks are to be used for some 200 women patients.

GLOUCESTER had 1237 patients in residence at its COUNTY AND CITY MENTAL HOSPITALS at WOTTON and CONEY HILL at the end of last year. Consideration is being given to means of reducing the present overcrowding. The recovery-rate was 34·96 per cent. and the death-rate 5·49 per cent. These excellent figures are ascribed by the medical superintendent to the improvement in diet and hygiene of recent years, and also to the higher standard of nursing. The hospital gardens supplied an exceptionally large quantity of fresh fruit for the patients. The general health was good; there were four cases of enteric, five of erysipelas, two of scarlet fever, two of diphtheria, and nine of pulmonary tuberculosis. The system of parole has been extended, but is only allowed to men. An out-patient clinic has been opened at the Gloucestershire Royal Infirmary. A pharmacist and a trained laboratory assistant have been appointed, together with a complete staff of visiting specialists. General paralysis is now being treated with malaria. Every effort is made to keep the patients usefully employed; 592 were working during the year in the service of the hospital. A canteen has been opened and has proved self-supporting. During the year 10 men and 15 women nurses obtained their R.M.P.A. certificate, bringing the total certificated to 40 men and 36 women.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED SEPT. 19TH, 1931.

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 45 (last week 19); scarlet fever, 1750; diphtheria, 948; enteric fever, 43; pneumonia, 583; puerperal fever, 27; puerperal pyrexia, 116; cerebro-spinal fever, 24; acute poliomyelitis, 7; acute polio-encephalitis, 3; encephalitis lethargica, 14; dysentery, 51; ophthalmia neonatorum, 98. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Sept. 22nd-23rd was as follows: Small-pox, 55 under treatment, 5 under observation (last week 43 and 3 respectively); scarlet fever, 1184; diphtheria, 1350; enteric fever, 15; measles, 95; whooping-cough, 357; puerperal fever, 15 (plus 10 babies); encephalitis lethargica, 215; poliomyelitis, 9; "other diseases," 94. At St. Margaret's Hospital there were 16 babies (plus 12 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 2 (1) from enteric fever, 10 (1) from measles, 3 (0) from scarlet fever, 21 (4) from whooping-cough, 25 (1) from diphtheria, 44 (8) from diarrhœa and enteritis under two years, and 27 (5) from influenza. The figures in parentheses are those for London itself.

The fatal case of enteric fever outside London occurred at Norwich. Two deaths from measles were reported at Bradford. Four fatal cases of whooping-cough occurred at Liverpool, 3 at Manchester, and 2 each at Birmingham and Newcastle-on-Tyne. Liverpool and Leeds each reported 4 deaths from diphtheria, Halifax 2. Diarrhœa was credited with 6 deaths at Liverpool, 4 at Hull, and 3 at Bolton.

The number of stillbirths notified during the week was 277 (corresponding to a rate of 43 per 1000 births), including 53 in London.

OBITUARY

MARK PURCELL MAYO COLLIER, M.S. Lond., F.R.C.S. Eng.

Mr. Mayo Collier, who died on Sept. 20th at the age of 74, had retired from active practice a good many years ago, and had made his home at Kearsney Abbey, in Kent. He was the son of G. F. Collier, physician-in-ordinary to George IV. and William IV., and was educated at Godolphin Grammar School, Hammersmith, University College, London, and St. Thomas's Hospital. Qualifying as L.S.A. in 1878 he went to the Turko-Russian war in medical charge of the Dardanelles expedition. Returning to England he held a number of resident posts at St. Thomas's Hospital, graduated as M.B. with honours in 1881, and was appointed surgeon to the throat and ear department at the North-West London Hospital. At one time he was also assistant demonstrator of anatomy and physiology at the London Hospital Medical College, and later, in 1889, he was professor of comparative anatomy and physiology at the Royal College of Surgeons. His various interests expressed themselves in a book on the "Physiology of the Vascular System" and in research on the mechanism of the heart beat (1887), as well as in numerous papers on general surgery. He soon joined the full surgical staff of the North-West London Hospital, but remained in charge of his old department and paid close attention to his specialty. He held office as president of the British Laryngological Society some 30 years ago, and was elected an honorary member of similar societies abroad. At the same time his outlook was unusually broad, and comprised many branches of medicine besides the one he made his own. As an author he collaborated with Morell Mackenzie in a book on "The Hygiene of the Vocal Organs," and with Lennox Browne in "Diseases of the Throat and Nose." His independent work included studies of mouth breathing, progressive deafness, and intermittent nasal obstruction.

Mr. Collier married, in 1901, Florence, daughter of the late Dr. Spooner Hart, of Calcutta, and Corowa, New South Wales. She survives him.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE.

Surg. Lt.-Comdr. A. G. Bee to be Surg.-Comdr.
Surg. Lts. E. T. S. Rudd and R. C. Foster to be Surg. Lt.-Comdrs.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Lt. F. M. B. Allen to be Surg. Lt.-Comdr.
Surg. Sub-Lt. C. P. Collins to be Surg. Lt.
The following appts. are notified: Surg. Lt.-Comdrs. G. F. Abercrombie to *Malaya*, and St. G. B. D. Gray to *Repulse*.

ROYAL ARMY MEDICAL CORPS.

Maj. E. C. Lambkin retires on retd. pay.
Lt. E. F. Hunt relinquishes his temp. commn.

REGULAR ARMY RESERVE OF OFFICERS.

Lt.-Gen. Sir T. H. John C. Goodwin, K.C.B., C.M.G., D.S.O., late R.A.M.C., having attained the age limit of liability to recall, ceases to belong to the Res. of Off.

TERRITORIAL ARMY.

Lt. J. D. Robertson to be Capt.

INDIAN MEDICAL SERVICE.

Lts. E. A. R. Ardeshir and P. L. O'Neill to be Capts. (prov.).
Lt.-Col. J. V. MacDonald retires on account of ill-health.

CORRESPONDENCE

ECONOMY IN THE SOCIAL SERVICES.

BASIC PRINCIPLES.

To the Editor of THE LANCET.

SIR,—You have opened your columns to a discussion on economy in the social services, and I have read the views of your eight anonymous correspondents, which would have been of more value to me if I knew the local circumstances of the writers.

Health department expenditure falls under *capital*, on buildings and institutions, and *revenue*, on upkeep and maintenance of these, and actual work in the various sections, which appears mainly as salaries and wages. Every item of capital expenditure is followed by resultant revenue costs. Capital outlay may be for the purpose of replacing existing methods that have proved themselves inefficient, slow, or costly, by means of greater thoroughness, speed, or cheapness; or it may be the result of undertaking a new line of effort not previously attempted at all, and only after the pros and cons have been carefully weighed up by the officers at the head of the department, by the health committee, by the council, and finally by the Ministry of Health. Among the considerations is, of course, that of whether the new proposals can be afforded at the moment or not. Such proposals are most frequently initiated by the medical officer of health, who but rarely submits them to the inevitable criticism without having satisfied himself of their soundness, of which he must be the first judge. He also must watch plans and control designs and equipment to ensure economy and convenience in working. It sometimes happens that he finds it necessary to oppose, on the grounds of cost, unsuitability or inexpedience, proposals that are put forward by enthusiastic members of his committee or subcommittee, and such proposals most often originate from counsels emanating from the heart rather than the head.

But it is in the control of revenue-costs chiefly and most constantly that the medical officer of health who is a good administrator finds his attention most closely demanded. A good administrator should know the work of each subordinate, except that of a specialist medical officer, as well as the latter does himself, and only by such knowledge and constant personal observation can he see leakages in cost, or effort, effectively. Too many people are anxious to start at the top of the ladder instead of climbing up gradually. In a fever hospital this is particularly seen, where observation of fuel consumption, both boiler and domestic, of gas or electricity, of breakages, of drugs, and so forth, have to be carefully watched.

Much depends upon a good matron to check wastage of food. The institution of a swill-tub, while excellent in theory, has been known to lead to much wastage of food, particularly where there are tuberculosis wards. The refuse from a sanatorium pavilion, which is considerable, should be boiled or sterilised before use for animals. The matron, or housekeeper, can effect much economy in the sewing-room, by the cutting up of old blankets, sheets, &c., and using their less-worn parts for patching and mending others. The laundry, too, repays attention to the amount of soda and soap consumed; these account for a very considerable sum per annum. The reducing of all hospital accounts to a costing system will help considerably to point to any items that are showing undue increase week by week, and it may be possible to work out costs of different wards in the same way, though administrative expenses must be watched, or it may be found that detection of a leakage costs more than the leakage itself. Salaries are pretty well standardised, and there are any number of "experts" to see that they are kept at as low a figure as possible, so that we need hardly spend time in considering them. But the number of persons employed needs to be watched, as in the case of hospitals and office staffs, where only too often the numbers are inadequate for the functions they have to perform.

Modification of the aims of the department may have to be made occasionally. Thus it may not be necessary to send so large a proportion of the scarlet fevers to hospitals, substituting pneumonia and measles, though this may not tend to the lowering of expenditure. Serum immunisation offers a prospect of considerable saving by prevention of diphtheria, for example, and should be resorted to on a large scale—e.g., in the schools where the disease is common. Financial saving must, however, not be looked for at once. Coördination, as close as possible, should be effected with all other bodies engaged in social amelioration, to avoid overlapping, and as far as possible the health department should confine itself to preventive measures, leaving actual treatment to the general practitioner or to hospitals. Thus maternity and child welfare centres should concern themselves with their original purpose, that of keeping children well, and should not attempt to treat the sick. The same principle applies to the tuberculosis dispensary, which was never designed to be an out-patient dispensary.

Many of us are now finding the late poor-law hospital grossly inadequate, owing to its treatment as in-patients of a large proportion of cases who could quite well remain at home, with occasional visits from a district nurse, if one were available. It may therefore be advisable to set going a district nursing association to relieve the hospital, and save much capital expenditure.

Finally, occasional examination of each of the sections should be made to make sure that it is worth while, and that its staff are all pulling their weight, and necessary alterations and adjustments effected. All schemes involving capital outlay should be very carefully examined, and, if possible, postponed for the present, and only the simplest and least elaborate plans put forward at all, and those only when circumstances absolutely demand.

Most of the suggestions put forward by your previous correspondents seemed to me of the type that any capable administrator is bound to have under his consideration all the time, and the thoroughness of their observation is really a measure of his capability. One suggestion, however, in communication IV. struck me as having its distinct possibilities, viz., the coördination of neighbouring local authorities for the combined purchase of hospital stores, and so economising on quantity and standardising requirements.

I am, Sir, yours faithfully,

H. KERR,
Medical Officer of Health, Newcastle upon Tyne.

Sept. 22nd, 1931.

JOINT COMPLICATIONS OF SCARLET FEVER.

To the Editor of THE LANCET.

SIR,—The annotation on this subject last week (p. 694) is of interest on account of recent work on rheumatic fever and its association with hæmolytic streptococcal naso-pharyngeal infections.

Apart from a pyæmic group, I note that Dr. Zischinsky divides his cases of post-scarlatinal arthritis into early and late developing types. In the former the symptoms appear between the fifth and the twelfth day after the throat infection, in the latter after the twelfth day. His terminology is curious, and it is difficult to understand what he means by "acute rheumatoid arthritis," hence comparison must be guarded. However, I have also observed two types of arthritis occurring after acute hæmolytic streptococcal sore-throats (both scarlatinal and non-scarlatinal). The first type appears on or about the fifth day, and the second later between the eighth and the twenty-first day. In the cases I have observed the arthritic symptoms in the early developing group were of varying intensity, but always cleared up in a few days without further complication, while those in the late developing group were apt to be complicated by carditis. I have to hand the notes of four cases from the latter group. All four developed an acute hæmolytic streptococcal sore-throat; after a silent period of 9, 12, 14, and 21 days respectively polyarthritis appeared, and was subsequently complicated by carditis in every case. In no case was there a previous history of acute rheumatism or carditis.

It is surprising to find therefore that Dr. Zischinsky's late developing group of 102 cases were completely free from cardiac complications. Even taking into consideration the fact that cardiac involvement in acute rheumatism is supposed to be much commoner in this country than on the continent, it is hard to explain this difference if we assume that both are manifestations of acute rheumatism.

It would be of great interest to hear the views on this point of medical officers from fever hospitals in this country.

I am, Sir, yours faithfully,

W. ROBERT F. COLLIS.

Research Department, Hospital for Sick Children, Great Ormond-street, Sept. 28th, 1931.

THE EXTERNAL SIGNS OF INTELLIGENCE.

To the Editor of THE LANCET.

SIR,—Referring to the review of my book on Brain, Mind, and the External Signs of Intelligence, in your issue of Sept. 26th (p. 690), will you kindly allow me to correct the statement that the author "*derides* laboratory technique, both physiological and pathological." I have done nothing of the kind. All I have endeavoured to demonstrate is that the methods followed hitherto have not led to the discovery of the primary mental functions of the brain, chiefly owing to the false preconceived views which guided the investigator. It is in consequence of this failure that many experts have reverted to the opinion, held a century ago, that the brain acts as a whole and that localisation of mental functions is impossible.

Sixty years ago it was confidently anticipated that experiments on the exposed brains of living animals would "speedily disclose the nature of the mind and the inner working of the brain, and make mental disorders disappear for ever." As is well known, these extravagant hopes have not been fulfilled.

Great results have been expected also from the study of the microscopical anatomy of the cortex of the brain; and, indeed, we have learnt much about the configuration of the various layers of brain cells and their arrangement in structurally differentiated territories. But there still prevail conflicting opinions as to the significance of these discoveries. Brains of men of renown have been cut into as many as 30,000 minute sections, a wonderful feat in itself; yet we have learnt very little from it, not knowing what signs to look for as indicating individual greatness. No one is as yet able to explain why one man's genius should take the direction of a Newton, while that of another develops into a Shakespeare or a Michel Angelo; or why one man should become saintly in character, while another, with the same education and environment, develops a genius for crime.

I have given due credit to the valuable work done by histologists—like Shaw Bolton regarding the pathology of amentia and dementia, and Sir Frederick Mott as regards dementia paralytica—but there is nothing to help us either in the diagnosis or treatment of mental disorders in the living man.

Your reviewer also states that the author "is of the opinion that the brain is as much an organ for the expression of instinct and emotion as it is of intelligence, but he devotes his attention entirely to the cortex, *ignoring the importance of the thalamus in this respect and the part played by the endocrine glands in the governing of temperament.*" This is not true. As regards the functions of the optic thalamus, I have quoted the work done by Sir Henry Head and Dr. Gordon Holmes, who have shown this structure to be the central organ for the conveying of sensations. It is well known, also, that projection fibres ascend from the thalamus to certain regions of the brain, and the evidence produced in my book tends to prove that stimulation of these regions leads to the manifestation of definite emotions.

As regards neglecting "the part played by the endocrine glands," there are no less than seven references to them in my book. One passage (on p. 25) will suffice to explain my view: "Excess of certain glandular secretions can increase specific emotions—such as fear and anger—but they do not create them. The disposition to them must be pre-existent. We all differ in our primary emotions, quite independently of the state of our internal organs and glandular secretions."

This passage may also serve as answer to the further criticism that the author seems "to have ignored the fact, confirmed by biological as well as by neurological studies, that *behaviour is a function of the organism as a whole.*" All depends what we mean by behaviour, whether we include the actions of the primary instincts or refer only to the emotions. Granted, as I have said in my book, that the effect of the latter is an all-pervading one, there must be a centre from which the impulse starts.

In conclusion, I should like to draw attention to the fact, of which everyone who has studied the history of brain research must be aware, that each generation of investigators held dogmatic views which guided them in their methods and influenced their results. To-day, two exactly opposite opinions are held. On the one hand, the British view, endorsed by the highest authorities, that "It is obvious that each region of the cerebral cortex must be of equal functional importance," and the continental opinion (held by the chiefs of the Institutes for Brain Research of Berlin, Vienna, and Leningrad) that "there must be

an anatomical basis for the different human capacities and individual talents." Considering these conflicting views, the information contained in my book should prove of value to every investigator, and should be read by every physician interested in the problem of the relation of mental activities to brain functions. And on this point, I am pleased to see, your reviewer seems to agree.

I am, Sir, yours faithfully,

BERNARD HOLLANDER.

Wimpole-street, W., Sept. 28th, 1931.

OPERATIVE TREATMENT OF HYDROCELE.

To the Editor of THE LANCET.

SIR,—In your last issue (p. 680), Mr. Mooro calls attention to the value of the cautery in carrying out a radical operation for hydrocele of the tunica vaginalis. From my experience I agree with him that the procedure is well worth adopting. Most surgeons must have had experience of troublesome hæmatomas forming after this operation has been carried out with the knife. However careful one is to use all ordinary methods of hæmostasis they are liable to occur, especially in old-standing cases in which the sac is thickened. For the past four years when operating for hydrocele I have removed the parietal sac as a routine with the diathermy needle. I have also used the actual cautery in a few cases. If it is available, the diathermy cautery is extraordinarily convenient and easy to control, and involves no risk of damaging the body of the testis. With due care similar results are no doubt obtained with the actual cautery. I have several times observed considerable temporary swelling in the testicle following this operation, but not greater than is observed when the older method is used. I am, Sir, yours faithfully,

Harley-street, W., Sept. 28th, 1931. C. MAX PAGE.

THE STREPTOCOCCAL THEORY OF ACUTE RHEUMATISM.

To the Editor of THE LANCET.

SIR,—In an annotation on p. 694 of your last issue I read the sentence: "Recent research on streptococcal throat infections and acute rheumatic fever has revived interest in the streptococcal theory of rheumatism." May I suggest that the valuable work of Dr. B. Schlesinger, Dr. W. Sheldon, and Dr. W. R. F. Collis, to say nothing of the researches of the American and German schools of thought, have not *revived* interest, but have added *new* interest by striving to open up the path which may lead to the solution of the exact part taken by streptococcal infection in rheumatism? Can the work of Triboulet, Menzer, and Gustav Singer at the beginning of this century be already forgotten? Can the fact—not the theory—that a streptococcus isolated from an acute rheumatic sore-throat could produce in uninjured cardiac valves carditis, and also arthritis, &c., in animals, and be recovered from the lesions in pure culture, ever lose interest in this country where acute rheumatism is so rife? We early investigators feared to dwell too much upon the experiments showing that streptococcal angina faucium was a cause of carditis and arthritis, because we foresaw the hecatombs of tonsillar operations which would follow and have followed, and knew full well that the problem of acute rheumatism was only partially discerned.

The *silent* period before the rheumatism develops after the tonsillitis is now the centre of attention—giving a glimmer of hope that some new discovery as to its meaning may lead us a step nearer in our search for the truth, for a test, and even for a remedy. There may, perchance, be a cause of acute rheumatism unthought of and hidden from us, but I dare to write that streptococcal infection will always prove of interest in the history of this disease, and to think that it will prove to be the exciting cause. It would be grimly humorous to me if I believed that the streptococcal theory had ever lost interest in England; but too much practical work toward prevention of the disease has been done over these 30 years by those who have leaned to the streptococcal theory to make me either cynical or sad.

I am, Sir, yours faithfully,

F. JOHN POYNTON.

Harley-street, W., Sept. 28th, 1931.

HEALTH OF MERCHANT SEAMEN.

To the Editor of THE LANCET.

SIR,—It was a grief to see mention in your last issue of the deaths of Sir William Simpson and Dr. W. F. Dearden, who were both anxious to improve the health of merchant seamen. Sir William Simpson had many other medical interests, through which he will be longer remembered, but he had the welfare of seamen at heart, and at various meetings said weighty words on their behalf. Dr. Dearden did a great deal at Manchester to direct attention to and to improve the conditions of their work. Younger men, interested in the hygiene of the mercantile marine, are coming on, but the cause of the seamen has for the moment lost valued support by the deaths of these experienced advocates.

I am, Sir, yours faithfully,

Tunbridge Wells, Sept. 29th, 1931. W. E. HOME.

ROYAL MEDICAL BENEVOLENT FUND. — The number of new applicants helped by this Fund during the last three months of each year has usually averaged about 33, this being in addition to the grants which have been renewed to old beneficiaries. This year only seven new applications can be considered between now and the end of December unless further support is given. At the last meeting of the committee, 34 grants were voted, amounting to £577 10s. The following are particulars of two cases helped:—

Widow, aged 35, of M.R.C.S. The husband qualified in 1930, and a fortnight before he was to sail to take up an appointment in a Medical Service abroad he was accidentally killed at the age of 28. The young widow is left with two infant children, a girl of 2 years and a boy of 7 months. She has £55 a year. Fund voted £26 in four instalments. Personal service and possible further help will be given.

Widow, aged 38, of M.B. Husband died in November, 1930, at the age of 47. The widow is left with two boys, ages 9 and 6, to educate. She is suffering from encephalitis lethargica, and is quite incapable of earning a living or even attending to her household affairs. A medical man in supporting the application writes "that the case is deserving of the utmost possible help." The widow is left with 30s. a week. Fund voted £26 in four instalments. Other societies are being approached to coöperate in this case.

BRIGHTON SEWER OUTFALL. — On Sept. 23rd the reconstructed sewer outfall and pumping plant at Portobello, some miles eastward of the centre of Brighton, was formally opened. The outfall has now been carried considerably further out to sea, and the pumping plant enables the sewer to discharge at all states of the tide. Hitherto, the discharge has been restricted by the fact that when the tide rose to the level of the sewer it entered it. An electrically operated sluice-gate now excludes the sea, pumps raise the sewage over the gate, and then by gravitation the sewage delivers itself into the sea. The total cost of the work was £78,000. It was the scheme of Mr. David Edwards, surveyor and engineer to the Sewers Board and Borough Surveyor of Brighton, and it displaced an earlier scheme for which the figure was £110,900.

PANEL AND CONTRACT PRACTICE

EXCESSIVE CERTIFICATION: ITS REAL CAUSE.

"HAVING read with care your report (August 8th, p. 320) of the debate in the House of Commons on excessive certification," writes Rural Panel, "I have been waiting for someone to expose the real cause of the increase in certification which was hardly mentioned in the debate. In their excellent analysis (Sept. 12th, p. 603) the Paddington Medical Society get nearer to the truth, but still no one appears to have the courage to state clearly and emphatically that in the present state of medical science doctors are not capable of distinguishing definitely in every case the malingerer or semi-malingerer from the genuine unable-to-work case.

"In the past it has been assumed that some 99 per cent. of patients who claim a certificate are genuinely incapable of work. Every panel doctor knows that that percentage is rapidly decreasing from a variety of causes, the chief of which are economic factors due to industrial depression and unemployment, and a greater knowledge of, and pertinacity in claiming their 'rights' by insured patients. The public appear to consider that increased claims should be dealt with by the insurance practitioner refusing to certify any but the genuine cases and that therefore increased certification must, apart from an actual increase in sickness, be due to laxity on the part of the doctors. It is not nearly so simple as that.

"Every doctor knows that a large number of serious organic lesions are heralded in their early stages by subjective symptoms only. Every doctor can quote a dozen cases where complete investigation in a hospital or by a consultant has resulted in a diagnosis of hysteria, neurosis, or malingering, only for some serious or mortal complaint to develop subsequently. To mention only a few, the early stages of caries of the spine, cerebral tumour, tuberculosis of the lungs or intestine, or disseminated sclerosis may have no physical signs. On the grounds of humanity alone the panel doctor must give the patient the benefit of the doubt, and on other grounds if he has once refused a certificate to a patient who later dies of, say, a growth of the lung, he is not likely to repeat it. No one likes to think of his late patient's relatives going round saying 'Dr. X. said he couldn't find nothing wrong with him, and didn't see why he couldn't work—and we're a'burying of him to-morrow.' The point I wish to emphasise is that such errors are not due to incompetence or scamped examination, but are inherent in the present state of medical knowledge.

"What is the remedy? An increase in the number of cases referred to the regional medical officers? Not necessarily. Except in so far as the passage of time may reveal or fail to reveal the development of some physical signs the R.M.O. is no more likely to be certain of discriminating such cases as I have mentioned from malingerers or neurotics than the patient's panel doctor. It seems to me from practical observation that the R.M.O's. function is not so much to check or correct the opinion of the panel practitioner as to ability to work, but to scare the fraudulent claimant into signing off under the vague menace of a doctor of superior powers who will see through his claim. There are undoubtedly a certain number of genuine claimants who are declared fit by the R.M.O. but who cannot and do not resume work. At the same time, the R.M.O. clearly has his place in preventing excessive certification and instead of approved societies referring patients indiscriminately (and in many cases ridiculously) as they do at present, it should be made easier for the insurance practitioner to refer doubtful cases.

"At present the coöperation of the panel doctor in saving the funds of the societies is made too difficult. It could be made easier in three ways.

"1. Certain diagnoses could be referred to the R.M.O. automatically—e.g., anæmia, debility, gastritis, neurosis, neurasthenia, and hysteria. A practitioner certifying a patient as unfit from any of these causes would know that the case would come under revision; and his patient would not know.

"2. I have several times written in the space for remarks: 'Please refer to R.M.O.' and nothing has been done about it to my knowledge. This could be remedied.

"3. The form by which a practitioner can refer cases to the R.M.O. could be simplified and addressed, prepaid envelopes supplied.

"More important, however, than a greater discrimination in cases referred to the R.M.O. I regard an increase in sick visitation by the societies. Rules should be strict and the genuine case will keep to them; the fraudulent should be made to feel that the game is not worth the candle. Lastly, cases that are proved not to be genuine, admittedly a difficult matter, should be proceeded against by their societies and examples made of them—and published. To my mind the root of the trouble is that the approved societies have two conflicting aims. On the one hand they wish to attract members to their own particular society and keep them contented when enrolled; on the other, they wish to safeguard their accumulated funds. The unfortunate panel doctor has to hold the balance and in the present state of economic depression his medical knowledge will not enable him to do so."

MEDICAL DEFENCE UNION: ANNUAL MEETING.—The annual general meeting of the Medical Defence Union was held in London on Sept. 24th. Dr. W. S. A. Griffith, the acting president, who presided, began by referring to the death of Sir Herbert Waterhouse, the late president, and of Dr. Hedley Hill, Dr. W. Tracy Lydall, and Dr. Seymour Taylor. He went on to congratulate the members upon the steady growth and continued prosperity of the Union. When he (Dr. Griffith) vacated the office of president in 1901, the membership was 4605 and the accumulated fund stood at £918. The membership was now 16,587 and the accumulated fund £55,780. The weight and influence of the Union had steadily increased, and there was no difficulty with which a practising doctor is liable to be confronted, in which he could not derive great advantage from the experience which the Union had acquired. It was stipulated, however, that every member applying for assistance must be in benefit—that is his subscription must not be in arrear—and there must be a professional principle involved. Further, the Council reserved itself absolute discretion whether and in what manner it would accede to the member's request. It had recently been decided that a candidate when elected should be in benefit from the date of the receipt of his subscription. Unfortunately, said Dr. Griffith, there were still many practitioners who allowed themselves to remain unprotected against the attacks of unscrupulous persons and their own errors. Everyone engaged in practice should join one or other of the defence societies, and having joined should pay his subscription regularly and consult the secretary at the first hint of trouble.

The report of the Council and the financial statement for 1930 were adopted unanimously. Dr. W. S. A. Griffith, Dr. V. A. Jaynes, and Dr. A. Lyndon, the retiring members of Council, were re-elected.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS.

THE Finance No. 2 Bill was read a second time in the House of Commons on Wednesday, Sept. 23rd.

HEALTH INSURANCE CUT—CONCESSION TO DOCTORS.

On Friday, Sept. 25th, the House of Commons further considered the National Economy Bill in Committee. Captain BOURNE, Deputy Chairman of Committees, was in the chair.

On the schedule, which enumerates the services in respect of which Orders in Council may be made under the Bill,

Mr. RHYS DAVIES moved to leave out the reference to National Health Insurance. He said that this subject had not been very clearly explained. What had happened was that the Minister of Health and his Department in the statement made in the White Paper would lead the nation and the House of Commons to believe that the panel doctors had been gracious and generous enough to hand over to the Treasury £850,000 per annum of their own money. The case was not exactly like that. On the second reading of the Bill the Minister of Health had said: "The result is that the effect of the proposal to deduct a certain proportion of the remuneration of doctors and chemists, and to return the deduction to the Exchequer, is that you give back to the Exchequer something which the Exchequer had already paid out for another purpose." That did not seem to be very clear. What happened, apparently, was that the Minister of Health went to the British Medical Association and said "the pound sterling is languishing from nervous debility, and our export trade is suffering from Bright's disease," and the Association was asked to come to the rescue of the pound sterling. The panel doctors were paid a 9*s*. capitation grant in respect of each of the 15,000,000 insured persons. With the exception of a very small contribution from the Exchequer, the whole of the 9*s*. came out of the funds of the approved societies. It might be rightly assumed that if any reduction was made in the 9*s*. paid to the doctors it ought to accrue to the funds of the societies from whence it came. The whole of this contract for a reduction was practically completed before the approved societies had a chance to say a word about it. It was reported, however, that the representatives of the societies had agreed to what had been done. That was typical of the Minister of Health. It was unfortunate that these funds were continually being raided by almost every successive Government. Mr. Churchill had taken away £2,250,000 per annum from these funds, and the present Minister of Health now proposed to take away about £1,000,000 per annum. The Minister of Health contended that the money which he was taking from the doctors and chemists would go back to the funds of the scheme and would relieve the State contribution to exactly that amount. He (Mr. Davies) had never heard of such financial jugglery. It was an astonishing fact that it was only in respect of National Health Insurance that the cuts proposed by the Government went very much beyond the demands contained in the recommendations of the May Committee.

Mr. CHAMBERLAIN (Minister of Health): Will the hon. Member explain how he arrives at that conclusion?

Mr. DAVIES said the May Committee suggested a saving on health insurance of only £1,000,000, but this Bill proposed a cut of £1,100,000. He would like to know whether they would get the same service from the doctors for 8*s*. as they now got for 9*s*. Since the Minister of Health made this arrangement with the chemists one of the largest firms had asked their staff to accept a reduction in wages as a consequence of the reduction in grant. The result would be that this firm would make a profit out of the transaction. He would also like to know if the Government were going to relieve themselves of the responsibility for a grant to the Central Fund. The Exchequer grants to these funds had fallen from £10,250,000 in 1921 to £6,250,000 in 1930, in spite of the fact that the number of insured persons had increased almost every year. If this process continued the time would come when the State would wipe its hands clean of this scheme. He did not criticise the professional work of the doctors, but he was very much afraid that as a result of these reductions they would increase their charges to non-panel patients, and in the end he doubted whether the doctors would suffer much.

Dr. MORRIS-JONES: Is the hon. Member aware that whereas the panel doctors have suffered a cut of over 10 per cent. no reduction has been made in the amount given to the approved societies for administration?

Mr. DAVIES: If this Government unfortunately lasts long enough that may come down also.

Dr. MORRIS-JONES: It ought to come down now.

Mr. DAVIES said that perhaps the societies would do what the Navy did and "larn them a lesson." He was astonished that the Minister of Health, who had been searching every nook and corner, had left out the dentists and opticians. In 1913 there were 12,674 panel doctors; in 1930 there were 15,750. The average annual income of each panel doctor rose from £304 in 1913 to £463 in 1930. He did not think that the medical profession was overpaid, though the May Committee made a very scathing attack upon the capitation payment to doctors from insurance funds. They said that the local and municipal authorities found it very difficult to secure the services of medical men because the fees under the National Health Insurance scheme were so much higher than they were prepared to pay. There had been an increase in the fees of the doctors from £3,750,000 in 1913 to £7,250,000 in 1930. Those who had anything to do with the administration of these funds felt very sad about the present situation, because the result must be that benefits would be reduced. Statutory benefits would not be reduced at the moment, but dental, optical, and convalescent home benefits, as well as distress grants, would probably go by the board. It had been said that the Government had been very generous in securing £142,000 so that the societies who were not able to meet the statutory benefits would be helped from the Central Fund. That was called the partial pooling of surpluses. Once they began to pool surpluses in the end there would be no surpluses to pool. It had been highly gratifying to note the beneficial results on the health of the community of National Health Insurance. This country had practically the lowest general mortality-rate in the world. The infantile mortality-rate had declined by a half in one decade, and the excellent contribution of the panel doctors and the approved societies had helped considerably to achieve that object.

THE MINISTER'S REPLY.

Mr. CHAMBERLAIN expressed astonishment at the speech of Mr. Davies, who, he said, really did know something about National Health Insurance. There was not a shadow of excuse for his attempt to represent the action proposed as a raid on the funds of the societies. A sum of 15*s*. a head was allowed to be set aside for medical benefit under the Act, and out of that sum 9*s*. represented the remuneration given to the doctors. It was true that in the ordinary course the effect of any reduction would benefit the funds of the societies. But this was not the ordinary course of procedure. This reduction was never discussed upon merits but as a contribution by the

doctors and chemists to national needs. If they had been asked to give up 1*s.* simply for the sake of benefiting the funds of the societies they would have refused and have fought the case from one end to the other. Mr. Davies appeared to have become confused as to what the May Committee recommended and what in fact the Government proposed to do. The contribution of the doctors was identically the same as the May Committee had recommended. The Committee estimated the saving in a full year at £750,000, but a closer estimate showed that it would be £850,000. It was true that the May Committee did not recommend any reduction in the remuneration of the chemists, but if the doctors were asked to make a contribution it was only reasonable that the chemists should do likewise, and they at once accepted it. A further difference between the proposals of the Government and those of the May Committee was that the latter included £100,000 to be saved by the non-extension of the Act. A slight alteration had been made in the proposals embodied in the White Paper. In accordance with the announcement of the Prime Minister certain alterations were going to be made in the cuts originally proposed in the pay of the police and the salaries of teachers. The cut from 9*s.* to 8*s.* in the case of the doctors represented a larger percentage—namely, 11 per cent. compared with 10 per cent.—and it seemed to him to be unfair to them, and inconsistent with the general scheme of the Government, that the doctors and the chemists should be left out of the scope of the proposed alterations. Accordingly he had written to the Insurance Committee of the British Medical Association and also the Pharmacists Union intimating that the Government proposed to substitute for the original proposals a simple 10 per cent. reduction in both cases. It meant that there would be a rather smaller sum available for saving—about £90,000 in a full year—but he hoped to be able to make that good by savings in other directions. Mr. Davies had touched upon the withholding of the State grant of £142,000 from the Central Fund. Anyone would suppose, from what the hon. Member had said, that this also was an attempt to raid the funds of the approved societies. But no one knew better than the hon. Member that the societies were very much relieved at the proposals of the Government in this connexion, because they realised that owing to the enormous increase in the claims for sickness benefit the position of the societies after the next valuation was going to be much less satisfactory than after the last. In fact, in some cases there might be societies who without outside help would not be able even to meet the statutory benefits. In such an event the resource available was the Central Fund, and it was to the interest therefore of the whole system, and of the weaker approved societies in particular, that the Central Fund should be made as strong as possible. That was what the Government were proposing to do. The £142,000 which would fall to be paid this year from the Exchequer would not be paid, but instead of that the Central Fund was to get £300,000 a year which it had not before, and, further, it was to get arrears of the £300,000 since 1928, which would amount to something like £1,000,000 to start with. So that the Central Fund would be in an unassailable position and able to guarantee the standard benefit all round. He thought he had shown conclusively that Mr. Rhys Davies's allegations or insinuations had no foundation whatever. So far as the approved societies were concerned, they would be made stronger, and not weaker, by the Government proposals.

Mr. THOMAS LEWIS supported the amendment. He said if there was to be a reduction in expenses, whether in regard to the fees of the medical profession or in any other way, National Health Insurance required the funds. He thought it was a wrong thing to take this money away from the approved societies. He was afraid, from an answer given by the Minister of Health a few days ago, that the measures for preventing maternal mortality, which were so imperative, were going to be delayed. Whatever might be the result of the present proposals, he hoped that the Minister of Health would keep in mind the question of the new maternity service and not allow it to go by the board.

Dr. MORRIS-JONES said he felt sure the medical profession would be pleased at the offer which had been made by the Minister of Health. It would have been hardly right, after the profession had accepted the cuts, not on their merits but simply as a gesture in this time of emergency, if they had been penalised for accepting quietly what a large number of other professions had not accepted. He was disappointed at the attitude of Mr. Davies. He would have expected the hon. Member to say that the medical profession in this instance had behaved extraordinarily well. It would have been a gracious act on his part as an administrator of the approved societies. While thanking Mr. Chamberlain for the concession he had made, he would like the right hon. gentleman to consider on what principle of equity the 4*s.* 6*d.* a head allowed for administration expenses of the approved societies remained unaltered. On the whole, the financial situation of the societies was such that they could bear with perfect equanimity a small reduction per head of administration expenses. This would give the approved societies an opportunity of following the very patriotic example of the medical profession.

The amendment was rejected by 237 votes to 153.

ECONOMY CUTS AND NATIONAL FITNESS.

On Monday, Sept. 28th, the House of Commons further considered the National Economy Bill in Committee. Captain BOURNE, Deputy Chairman of Committees, was in the chair.

On a motion by Mr. JOHNSTON to leave out the reference in the Schedule to Unemployment Insurance,

Dr. HASTINGS said that during the past week they had talked a great deal about the gold standard, and whether it ought to be maintained or not. He thought that the man standard of this country was of even greater importance. We could not afford to neglect anything which would help to maintain our man power, whether employed or unemployed, at the highest possible level of fitness and efficiency. We must depend upon such efficiency in producing the goods which were required to pay for our food and other imports. If the standard of living of the unemployed was lowered, the consequences might be serious. When an unemployed man found a difficulty in obtaining work he felt that he was not wanted, and if, added to that, he had to face destitution, the mental effects might be serious. Fortunately, in this country, we had not seen anything of that kind, but in other countries, where the unemployed were differently treated, it had led to a great increase in suicide and crime.

The amendment was rejected by 296 votes to 243.

ECONOMIES IN NATIONAL HEALTH INSURANCE.

On Tuesday, Sept. 29th, the House of Commons completed the committee stage of the National Economy Bill.

Dr. DRUMMOND SHIELS, speaking against the motion for the third reading of the Bill, referred to the proposed economies in National Health Insurance. He said that not very much had been said about the doctors and chemists. He had always found that it was very difficult to work up sympathy in the House of Commons for doctors and sometimes for chemists, but they were said to have taken their medicine without flinching. It had been hinted by one hon. Member that when they agreed to the cuts they were unaware that more income and petrol taxes were awaiting them. What was their present state of mind was not stated, but here again the real attack was not on the doctors and the chemists but on the social service of which they were a part. The Royal Commission had shown that the National Health Insurance system, while good as far

as it went, was quite inadequate. Hon. Members knew that the improvement of specialist service, of services for dependents, and many other developments were required before national insurance could be said to be an adequate service for its purpose. Yet instead of improvements they now had this setback, and the standard of working-class medical service was definitely lowered compared with that of other sections of the community.

Lieut.-Colonel FREMANTLE: Will the hon. Member explain if he really suggests that through this Bill, or in the White Paper, there is any suggestion that we shall cut down the consultant services?

Dr. SHIELS: No, but the hon. Member knows that I was not referring to that but to the development foreshadowed by the Royal Commission, and I want to point out that National Health Insurance is a vital service, and in view of the wonderful developments of medical and surgical skill, such services ought to be available in full and ample measure to the very humblest members of the community. They are not so now and the effect of this Bill in regard to these services is definitely to lower its status. —The Bill was read the third time by 297 votes to 242.

The measure was afterwards introduced by the Marquess of READING in the House of Lords and read a first time.

HOUSE OF COMMONS.

WEDNESDAY, SEPT. 23RD.

Health Services in African Colonies.

Mr. HORRABIN asked the Secretary for the Colonies whether the grants or loans, made or approved, towards technical education, the training of African dispensers, sanitary inspectors, &c., would be affected by the proposed reductions in the Colonial Development Fund; and whether further grants or loans of this kind were to be discontinued. —Mr. THOMAS replied: The answer to the first part of the question is in the negative. As regards the second part, schemes submitted by Colonial Governments will be considered, as in the past, on their individual merits, but regard will be paid to the consideration set forth on page 8 of the White Paper (Cmd. 3952) and to the reduced funds available.

THURSDAY, SEPT. 24TH.

Housing in Rural Areas.

Mr. PERRY asked the Minister of Health if the operation of the Housing (Rural Workers) Act, 1931, was to be suspended or restricted as part of the Government's economy policy; and, if so, what steps would be taken to meet the need for more and cheaper houses in rural areas.—Mr. CHAMBERLAIN replied: There is no intention of repealing the Housing (Rural Authorities) Act, 1931, to which I assume the hon. Member refers. Applications from rural district councils under this Act are still coming in, and in accordance with Subsection (3) of Section 1 all such applications will be eligible for consideration provided that they are made before Nov. 30th next. In accordance with the Act applications will be first considered by the committee appointed by my predecessor, of which the Paymaster-General is chairman.

Mr. PERRY: Are we to understand that the Government intend to proceed with this work?

Mr. CHAMBERLAIN: Yes, Sir.

Mortuary Accommodation in Yorkshire.

Mr. TURTON asked the Home Secretary whether his attention had been called to the coroner's inquest, on August 7th, on Wilfred Armstrong Rhodes, at Asenby, in the North Riding of Yorkshire, and to the fact that during the interval of three days between the recovery of the body and the holding of the inquest the body was laid in a shed; and whether he would take steps to secure that all proper provision was made for the housing of the body during such interval, so as to prevent distress to the relatives and the neighbourhood.—Sir H. SAMUEL replied: My attention had not been drawn to this case, but I have made inquiry and consulted the Minister of Health. I understand that no other accommodation in the nature of a mortuary was available, and the Minister informs me that the circumstances are such that he does not feel justified in pressing the local authority to provide a public mortuary.

Mr. TURTON: Will the right hon. gentleman take steps to see that the inquest takes place as soon after the death as possible and not after a delay of three days; and also to see whether it is possible that the body shall be housed in a more suitable place than a garage?

Sir H. SAMUEL: I will bear in mind the hon. Member's suggestion.

Specialist Advice for Prisoner in Parkhurst.

Sir COOPER RAWSON asked the Home Secretary why permission was refused by the governor of His Majesty's prison at Parkhurst for a heart specialist to visit a prisoner, a previous patient, who was suffering from angina pectoris; and whether it was possible to make any exception.—Sir HERBERT SAMUEL replied: The prisoner in question has been free from heart attacks during his sentence. He is receiving all necessary medical care and attention and, if necessary, the prison medical officer could call in a specialist. In these circumstances there is no reason for taking any exceptional course.

Maternal Mortality.

Dr. PHILLIPS asked the Minister of Health if he had yet received the final report of the departmental committee on maternal mortality and morbidity.—Mr. CHAMBERLAIN replied: No, Sir, but I understand that this report is now in preparation, and it will be completed as soon as practicable.

Approved Societies and Rheumatic Treatment.

Mr. PHILIP OLIVER asked the Minister of Health how many approved societies had included in their schemes of additional benefit particular benefits in respect of special treatment for rheumatic diseases.—Mr. CHAMBERLAIN replied: Five hundred and fifteen approved societies and branches have included in their schemes of additional benefits the particular additional benefit No. 16 under which special treatment for rheumatic diseases would be possible.

Feeding of Necessitous School-children.

Mr. TINKER asked the President of the Board of Education the number of local education authorities who had put into operation the feeding of necessitous school-children; and if he would give the latest figures of the number of children being fed.—Sir DONALD MACLEAN replied: In the week ending July 18th, 134 local education authorities made provision for the feeding of school-children. The number of children receiving meals was approximately 154,500, of whom 101,500 were necessitous children receiving meals free of charge.

Salaries of School Medical Officers.

Mr. BENJAMIN GARDNER asked the President of the Board of Education whether school medical officers were included among the officers other than teachers referred to in Circular 1413, issued Sept. 11th, 1931; whether his department had opened any negotiations with the British Medical Association in the matter of reductions of school medical officers' salaries; and, if so, whether he would communicate the result of any such negotiations to education authorities for the authorities' guidance, so that there might be a scale or scales of reductions generally acceptable and applicable throughout England and Wales.—Sir DONALD MACLEAN replied: The answer to the first part of the question is in the affirmative. I have not opened any negotiations with the British Medical Association in the matter of school medical officers' salaries, and the third part of the question does not therefore arise.

Safeguards in Regard to Imported Milk.

Lieut.-Colonel GAULT asked the Minister of Health whether, in view of the fact that certain distributors were purchasing milk imported from the Continent in the form of ice blocks, he would state whether the source of supply was subjected to the same tests as the milk produced in England; and, if not, whether he was prepared to take the necessary steps to protect English farmers from this kind of competition.—Mr. CHAMBERLAIN replied: The laws as to adulteration apply equally to liquid and frozen milk, and to imported and home-produced milk, with the added safeguard in the case of imported milk that it is subject to sampling at the time of importation. The regulations also require that imported milk should be free from tubercle bacilli and should not contain more than 100,000 bacteria per cubic centimetre. I am advised that these conditions are at least the equivalent of those which apply to English milk.

MONDAY, SEPT. 28TH.

Opium Exports from India.

Major GRAHAM POLE asked the Secretary of State for India if he would give the figures relating to the year 1930–31 and to the four previous years showing the amount of opium exported by the government of India and the total revenue received by the government of India on this account.—Sir S. HOARE replied: The amount of

opium exported from India during 1930–31 and four previous years was as follows:—

	Ounces.		Ounces.
1930–31	9,558,480	1927–28	18,259,840
1929–30	13,392,800	1926–27	26,254,592
1928–29 ..	14,951,975		

The gross revenue (before deduction of charges including the cost price of opium) derived from the export of opium in the financial years from 1926 was as follows:—

1929–30	£1,733,971	1927–28	£2,369,950
1928–29	£1,928,093	1926–27	£2,636,139

Figures for 1930–31 are not yet available.

Pension Claims.

Major COHEN asked the Minister of Pensions the number of claims submitted outside the seven years' time limit during the past 12 months; and the number admitted during that period either by way of award of pensions or provision of treatment.—Major TRYON replied: During the 12 months ended June last, a diminishing number of new applications, amounting in the aggregate to 11,193, were received. During the same period 13,000 claims were decided, out of which about 680 cases were admitted to pension, 275 were given other forms of pecuniary grant, and 22 were found to require not more than medical or surgical treatment.

Permanent Infirmity of Pension Orphans.

Major COHEN asked the Minister of Pensions, the number of allowances that had been extended beyond the age of 21 to total orphans who were unable to contribute to their own support because of mental or physical infirmity.—Major TRYON replied: Up to the end of June last allowances had been extended beyond the age of 21 to 72 orphans on the ground of permanent infirmity.

TUESDAY, SEPT. 29TH.

Imports of Liquid Milk.

Colonel RUGGLES-BRISE asked the President of the Board of Trade if any liquid milk was being imported into this country, and, if so, the quantity so imported to the nearest convenient date.—Sir PHILIP CUNLIFFE-LISTER replied: The only fresh liquid milk imported into the United Kingdom is from the Irish Free State, and mainly over the land boundary into Northern Ireland. During the first eight months of this year 30,484 cwts. of fresh milk was so imported. In addition, a small quantity, 2396 cwts., of unsweetened preserved milk (other than condensed and powdered milk) was imported into the United Kingdom.

Woman's Death from Asbestosis.

Mr. MUGGERIDGE asked the Home Secretary whether his attention had been called to an inquest at Ilford last week on a young woman who had been employed eight years before at an asbestos factory at Barking, the verdict being death due to asbestosis accelerated by tuberculosis; and whether he would amend the scheme for asbestos factories made under the Silicosis (Asbestosis) Act, 1930, which provided a period shorter than eight years between the employment and the certification of asbestosis, since it was now proved that once the lungs were affected the disease was incurable and, in the majority of cases, fatal.—Mr. STANLEY (Under-Secretary for Home Affairs) replied: The attention of my right hon. friend has been called to this case. The scheme for the asbestos industry does not apply to persons who had ceased to be employed in the industry at the time it was made, and no compensation would therefore have been payable in this case, quite apart from the time limit provision to which the hon. Member refers in his question. As regards the question of the time limit, it has not been found practicable in any of the schemes that are in force under the Act to dispense with some provision of the kind, but the department will discuss the point further with the industry, and consider whether some modification can be introduced into the scheme.

Unhealthy Basement Dwellings in London.

Mr. DAY asked the Minister of Health what investigations had been made into the number and description of occupants of basement dwellings in different parts of London; and if he would make a statement of any such investigations and the conclusions and recommendations arrived at.—Mr. E. D. SIMON replied: The report of the county medical officer of the London County Council for the year 1929 and the report of the school medical officer of the council for the year 1930 contain accounts of the investigations which have been carried out. The question of what further steps, if any, can usefully be taken to deal with unhealthy basements is, I understand, engaging the active consideration of the London County Council and the standing joint committee of the metropolitan borough councils.

MEDICAL NEWS

University of London.

King's College.—Four lectures on Blood Plasma and Platelets will be given by Mr. J. W. Pickering, D.Sc., on Tuesdays from Oct. 6th to 27th, at 5 P.M. At the same hour on Thursdays, from Oct. 15th to Nov. 5th, Mr. J. A. Hewitt, D.Sc., will speak on the Metabolism of the Carbohydrates and Fats.

University College.—Six lectures on the Physiology of the Sense Organs are to be given by Dr. R. J. Lythgoe on Mondays, from Oct. 12th to Nov. 16th, at 5 P.M., and four on the Respiratory Functions of the Blood, by Mr. L. E. Bayliss, Ph.D., at the same hour on Fridays, from Oct. 16th to Nov. 6th. Mr. Joseph Needham, Ph.D., will deliver four lectures entitled Speculation, Observation, and Experiment as illustrated by the History of Embryology, on Wednesdays, from Oct. 14th to Nov. 4th, at 5.30 P.M.

London Hospital Medical College.—The Schorstein lecture will be given in the Bearstead clinical theatre at 4.15 P.M. on Thursday, Oct. 15th, by Prof. Arthur J. Hall, whose subject will be Chronic Epidemic Encephalitis.

University College Hospital Medical School.—On Tuesdays, Oct. 13th and 20th, Prof. J. C. G. Ledingham, F.R.S., will speak on Resistance to Infection, Natural and Induced: on Oct. 27th and Nov. 3rd, Prof. C. R. Harington, F.R.S., on the Chemistry and Functions of the Thyroid Gland; on Nov. 10th and 17th, Miss Harriette Chick, D.Sc., on Vitamins and Disease; and on Nov. 24th and Dec. 1st and 8th, Dr. R. T. Grant on the Pathology of Endocarditis. All these lectures will be at 5.15 P.M. on Tuesdays in the Medical School.

London School of Hygiene.—The second course of Heath Clark lectures will be held at the School on Oct. 13th, 15th, 16th, 20th, and 22nd, at 5 P.M., by Sir George Newman. Its title is the Rise of Preventive Medicine.

London School of Economics.—Three lectures on the Production, Distribution, and Value of Milk will be given at the School by Prof. R. Stenhouse Williams, M.D., at 5 P.M., on Wednesdays, Oct. 14th, 21st, and 28th.

University of Leeds.

At recent examinations the following candidates were successful:—

M.D.

J. Phillips.

FINAL EXAMINATION FOR M.B., CH.B.

Part I.—J. H. Hudson, J. H. Lawrence, and R. Raines.

Part II.—N. W. Roberts, M. G. Ross, C. K. Shain, R. E. Tunbridge, and Lilian I. Walker.

Part III.—R. E. Tunbridge (second class honours), L. Glick, J. M. Holmes, G. Hyman, H. Mattison, N. W. Roberts, M. G. Ross, B. Schroeder, and Lilian I. Walker.

FINAL EXAMINATION FOR B.CH.D.

A Pearlson.

FINAL EXAMINATION FOR L.D.S.

J. E. Benfield, and A. H. Green.

D.P.H.

Catherine M. Gray.

The William Hey Medal and The West Riding Panel Practitioners' Prize have been awarded to P. R. Allison.

Gresham Lectures.

Four lectures on Great English Doctors and their Message will be given by Sir George Newman, at Gresham College, Basinghall-street, London, E.C., at 6 P.M., on Oct. 6th and the three following days.

Royal Institute of Public Health.

The Harben lectures will be delivered in the lecture theatre of the Institute, 37, Russell-square, London, W.C., at 4 P.M. on Oct. 5th, 6th, and 7th, by Dame Louise McIlroy, professor of obstetrics and gynæcology in the University of London. Her subject is Recent Researches in the Prevention of Maternal, Fœtal, and Neonatal Mortality, the three lectures being devoted respectively to the antenatal, intranatal, and postnatal periods. No ticket of admission is required.

A course of lectures on the Health of the Citizen will be given at the same address, at 4 P.M., on Wednesdays, from Oct. 14th to Dec. 16th. The first lecturer will be Sir Ernest Graham-Little, M.P., on the Health of the London Citizen. Subsequent speakers will be Sir Leonard Hill, F.R.S., Prof. F. J. Browne, Dr. L. E. Claremont, Prof. Winifred Cullis, Dr. D. Chalmers Watson, Dr. David Lees, Prof. H. R. Kenwood, Prof. E. L. Collis, and Sir Pendrill Varrier-Jones.

The annual congress of the Institute will be held at Belfast during Whitsuntide of next year, under the presidency of Lord Londonderry.

London Jewish Hospital Medical Society.

Mr. Maurice Sorsby will deliver a presidential address to this society on Deafness and its Prevention, on Oct. 8th, at 3.30 P.M., at the London Jewish Hospital, Stepney Green, E. Lord Moynihan is to be the guest at the annual dinner which will be held on Thursday, Dec. 10th, at 7.30 P.M., at the Trocadero Restaurant.

York Medical Society.

The centenary of this society will be celebrated by a meeting on Wednesday, Oct. 28th, when Lord Moynihan will deliver an oration. The Archbishop of York will attend a banquet in the evening.

Davos Tuberculosis Meeting.

In view of the general economic depression the Davos Medical Society has decided to postpone until next year the conference on tuberculosis which was to have been held from Oct. 5th–10th.

Institute of Hygiene.

A series of lectures will be delivered in the Lecture Hall of the Institute, 28, Portland-place, London, W., at 3.30 P.M., on Wednesdays, from Oct. 7th to Dec. 2nd. The first will be on the Prevention and Treatment of Mental Diseases, by Dr. William Brown. The other speakers will be Dr. W. Knowsley Sibley, Mr. Harold Barwell, Dr W. J. Pearson, Dr. R. D. Gillespie, Dr. Gerald Slot, Dr. F. H. Young, Dr. Percy Stocks, and Mr. J. C. Ainsworth-Davis.

International Society of Geographical Pathology.

This new society will hold its first conference at Geneva on Oct. 8th to 10th, under the presidency of Prof. Max Askanazy, who is largely responsible for its inception. More than 30 countries will be represented. The principal subject for discussion will be cirrhosis of the liver. Prof. de Josselin de Jong (Utrecht), Prof. Rössle (Berlin), Prof. N. Fiessinger (Paris), Dr. W. E. Gye (London), and Prof. F. C. Mann (U.S.A.) will deliver addresses on different aspects of the subject, and a general discussion will follow.

Contraceptive Technique and Practice.

Three lectures on Contraceptive Technique will be delivered at the Royal Institute of Public Health, 37, Russell-square, London, W.C., at 4 P.M. on Thursdays, Nov. 12th to 26th. The first, on the Graefenberg Silver Ring and Inter- and Intra-uterine Pessaries will be given by Prof. Leunbach of Copenhagen; the second, on the General Practitioner and Contraceptive Technique, by Sir Arbuthnot Lane; and the third, entitled Some Practical Points on Contraceptive Technique, by Mrs. Marie Stopes, D.Sc. Demonstrations will be held at the Clinic for Constructive Birth Control, 108, Whitfield-street, W.1, on Wednesdays, Nov. 4th and Dec. 2nd, from 2.30 to 5.30 P.M. The demonstrators will be Dr. M. B. Bayly, Dr. Jane Hawthorne, Dr. Marie Stopes, and Mr. Harold Chapple. Admission to lectures and demonstrations is restricted to members of the medical profession and senior medical students.

THE Society for the Provision of Birth Control Clinics informs us that particulars of its 15 centres in England, Wales, and Scotland, may be had from the secretary of the Society at the Walworth Women's Welfare Centre, 153A, East-street, S.E.17. Subscriptions should be addressed to the Hon. Mrs. Graham Murray, hon. treasurer, at the same address.

St. Mary's Hospital Post-graduate Course.

A post-graduate course, open to all practitioners, opens in the Medical School of St. Mary's Hospital, Paddington, W., to-day, Friday, Oct. 2nd, at 10.15 A.M., when Mr. A. J. Cokkinis will speak on the Treatment of Some Common Fractures. Subsequent lectures on Friday will be as follows: at 11, Mr. Duncan Fitzwilliams on Diseases of the Tongue; at noon, Dr. A. H. Douthwaite on the Treatment of Rheumatoid Arthritis; at 2.15 P.M., Dr. T. C. Hunt on Chronic Indigestion; and at 3.15, Mr. Leslie Williams on Prenatal Care. On Saturday Mr. Aleck Bourne will speak on the Causes and Treatment of Slow Labour (10.15 A.M.), Mr. Zachary Cope on Surgical Operations in Old People (11), Sir William Willcox on Colitis (noon), Mr. T. G. Stevens on Toxæmias of Pregnancy (2.15 P.M.), and Mr. E. P. Brockman on Common Disabilities of the Foot (3.15). The course will end on Sunday morning. At 10.15, Mr. R. M. Handfield-Jones will lecture on New Methods of Genito-urinary Surgery; at 11, Dr. C. M. Wilson on Fever without Signs; and at noon, Dr. R. A. Young on the Treatment of Chronic Cough.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

TUESDAY, Oct. 6th.—8.30 P.M., ORTHOPÆDICS. Mr. Harry Platt: Some Observations on Bone Tumours. (Presidential Address.)

WEDNESDAY.—5 P.M., HISTORY OF MEDICINE. Dr. R. O. Moon: Van Helmont, Chemist, Physician, Philosopher and Mystic. (Presidential Address.) Discussion: Vitalism in Science. Opener: Prof. A. Wolf. Other speakers will take part.

FRIDAY.—5 P.M., CLINICAL. (Cases at 4.30 P.M.). Cases: Mr. Cecil P. G. Wakeley: 1. A Mother and Two Children Suffering from Multiple Exostoses. 2. A Recurring Dislocation of the Shoulder in a Small Boy. 3. A Case of Marble Bones. 4. A Case of Congenital Deformities of the Ears and Hands in an Infant. Dr. B. Schlesinger: 5. Renal Infantilism. Mr. P. B. Roth: 6. Separation of Small Trochanter. Dr. N. Hobhouse: 7. Muscular Atrophy. Mr. G. B. Woodd-Walker: 8. Osteitis Fibrosa of Vertebræ. Dr. B. T. Parsons-Smith: 9. A Case of Multiple Aneurysms. Dr. F. Parkes Weber: 10. An Elderly Man who formerly for many years suffered from Angiitis Obliterans (Buerger's Disease). 11. Congenital Jaundice in an Elderly Man—probably belonging to the Congenital Hæmolytic Group. 12. Generalised Sclerodermis. 13. An Anæmic Breakdown or Crisis in a Child, not connected with Definite Congenital Hæmolytic Jaundice—Rapid Recovery. 14. Erythræmia with Frequent Jaundice Apparently of Hæmolytic Nature. Slow Recovery from Extremely Severe Hæmatemesis. Dr. F. Parkes Weber and Dr. M. Scholtz: 15. Cardiac Malformation—Septal Deficiency—with Compensatory Polycythæmia. Other cases will be shown. 8.30 P.M., OPHTHALMOLOGY. (Cases at 8 P.M.) Demonstration: Mr. T. Pomfret Kilner: Some Selected Cases of Reconstructive Surgery in the Orbital Region. Cases will be shown.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, Oct. 5th to SATURDAY, Oct. 10th.—METROPOLITAN HOSPITAL, Kingsland-road, E. Post-graduate course in general medicine and surgery. Daily 10.30 A.M. to 5.30 P.M.—CENTRAL LONDON OPHTHALMIC HOSPITAL, Judd-street, W.C. Post-graduate course in Ophthalmology. Every afternoon.—MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W. M.R.C.P. lectures at 8.30 P.M. as follows: Mond., Dr. W. Langdon-Brown: The Clinical Importance of Blood-sugar: High and Low. Wed., Dr. L. J. Witts: Achlorhydria.—CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C. Post-graduate course in Diseases of the Ear, Nose, and Throat. Clinical course, including Anatomy and Physiology lectures, and Course in Methods of Examination and Diagnosis.—HOSPITAL FOR TROPICAL DISEASES, Gordon-street, W.C. Course in Tropical Medicine, mornings and afternoons.—Further particulars from the Fellowship of Medicine.

HAMPSTEAD GENERAL AND NORTH-WEST LONDON HOSPITAL.

WEDNESDAY, Oct. 7th.—4 P.M., Sir William Willcox: Diabetes, Its Causation and Treatment, with Special Reference to its Toxic Causes.

NATIONAL HOSPITAL, Queen-square, W.C.

MONDAY, Oct. 5th.—2 P.M., Dr. Riddoch: Out-patient Clinic. 3.30 P.M., Dr. Purdon Martin: Acute Infections of the Central Nervous System.

TUESDAY.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Dr. Adie: Abnormalities of Pupillary Reactions.

WEDNESDAY.—2 P.M., Dr. Martin: Out-patient Clinic.

THURSDAY.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Dr. Gordon Holmes: Disturbances of Vision due to Cerebral Lesions.

FRIDAY.—12 noon.—Dr. Greenfield: Pathology of Nerve Cell (1). 2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M., Sir Percy Sargent: The Surgery of the Pituitary Body.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, Leicester-square, W.C.

TUESDAY, Oct. 6th.—5 P.M., Dr. W. N. Goldsmith: Anatomy and Physiology of the Skin.

THURSDAY.—5 P.M., Dr. J. M. H. MacLeod: Morphology and Histopathology of Elementary Lesions.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL, Denmark Hill, S.E.

THURSDAY, Oct. 8th.—9 P.M., Sir StClair Thomson: Cancer of the Larynx.

GRESHAM COLLEGE, Basinghall-street, E.C.
TUESDAY, Oct. 6th, and three following days.—6 P.M., Sir George Newman: Great English Doctors and their Message.

ST. MARK'S HOSPITAL, City-road, E.C.
THURSDAY, Oct. 8th.—4.30 P.M., Mr. P. Lockhart-Mummery: Diverticulitis.

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.C.
MONDAY, Oct. 5th, and following TUESDAY and WEDNESDAY. 4 P.M., Dame Louise McIlroy: Recent Researches in the Prevention of Maternal, Fœtal, and Neonatal Mortality. (Harben Lectures.)

MANCHESTER VICTORIA MEMORIAL JEWISH HOSPITAL, Elizabeth-street, Manchester.
WEDNESDAY, Oct. 7th.—4.30 P.M., Mr. R. R. Kerr: Cancerous and Precancerous Skin Conditions in Cotton Workers (with demonstration).

MANCHESTER ROYAL INFIRMARY POST-GRADUATE LECTURES.
TUESDAY, Oct. 6th.—4.15 P.M., Dr. A. H. Holmes: Treatment of Pneumonia.
FRIDAY.—4.15 P.M., Mr. E. W. Telford: Demonstration of Surgical Cases.

Appointments

CAMPBELL, G., L.R.C.P. Lond., M.R.C.S., has been appointed Certifying Surgeon under the Factory and Workshop Acts for Wolston, Warwick.

Queen Charlotte's Maternity Hospital, Marylebone-road, N.W. INCE, J. G. HASTINGS, L.R.C.P. Lond., M.R.C.S., Senior Resident Medical Officer. WILLIAMS, BRYAN, M.B., Ch.B.Ed. F.R.C.S. Ed., Assistant Resident Medical Officer. STUART, MARY S., L.R.C.P. Lond., M.R.C.S., District Resident Medical Officer.

Medical Referees under the Workmen's Compensation Act: DUFF, D., F.R.C.S., Edin., F.R.F.P.S., Glasg. (Dumbarton and Clackmannan); KERR, J. R., M.B., Ch.M. Glasg. (Southport and Ormskirk County Court).

Vacancies

For further information refer to the Advertisement columns.

Altrincham General Hospital.—Jun. H.S. At rate of £120.
Aylesbury, Royal Buckinghamshire Hospital.—Res. M.O. At rate of £200.
Bangor, Caernarvonshire and Anglesey Infirmary.—Res. H.S. and Jun. Res. H.S. £150 and £100 respectively.
Beckenham, Kent, Bethlem Hospital, Monks Orchard, Eden Park. Res. H.P. At rate of £150.
Bedford County Hospital.—H.S. and Asst. H.S. At rate of £175 and £130 respectively.
Belgrave Hospital for Children, Clapham-road, S.W.—Two H.P.'s. Each at rate of £100.
Benenden, Kent, National Sanatorium.—Res. Asst. M.O. £300.
Bolingbroke Hospital, Wandsworth Common, S.W.—H.S. At rate of £120.
Bradford, Royal Eye and Ear Hospital.—Jun. H.S. £150.
Bristol City and County Mental Hospital.—Third Asst. M.O. £450.
Bristol Eye Hospital.—Res. H.S. £150.
Bristol Royal Infirmary.—H.S. and H.P. Each £60.
Cheadle, Cheshire, Barnes Convalescent Hospital.—Res. M.O. £250.
Chester Royal Infirmary.—H.P. and two H.S.'s. Each £150.
Doncaster Royal Infirmary.—H.S. At rate of £175.
Ealing, King Edward Memorial Hospital.—Hon. Consulting Dermatologist.
Glamorgan County Mental Hospital, Bridgend.—Jun. Asst. M.O. £350.
Guy's Hospital Medical School, S.E.—Gull Studentship £250.
Hampstead General and N.W. London Hospital, Haverstock Hill, N.W.—H.S. At rate of £100.
Hospital for Consumption and Diseases of Chest, Brompton.—Asst. Res. M.O. £150. Also H.P. and Jun. H.P. Each £50 for six months.
Hospital for Sick Children, Great Ormond-street, W.C.—Med. Reg. £250.
Hull Maternity Home and Infants Hospital.—Sen. Res. M.O. £450.
Kingston-upon-Hull, City and County of.—Asst. M.O.H. £600.
Leamington Spa, Warneford General Hospital.—Res. H.S. and H.P. Each £165.
Leicester City General Hospital.—Res. M.O. £300.
Leyton Borough.—Deputy M.O.H., &c. £660.
Liverpool, Mill-road Infirmary.—Res. Asst. M.O. £200.
Macclesfield General Infirmary.—Second H.S. At rate of £150.
Manchester Royal Eye Hospital.—Jun. H.S. £120.
Manchester Royal Infirmary, Robey-street.—H.S. At rate of £100–£200.
Manchester, St. Mary's Hospital.—Two H.S.'s for Whitworth-street West Hospital. Each at rate of £50.
Margate and District General Hospital.—Res. M.O. £150.
Nottingham General Dispensary, Broad-street.—Res. Surgeon. £250.
Nottingham General Hospital.—H.P. At rate of £150.
Paddington Green, Children's Hospital, W.—H.P. and H.S. Each at rate of £150.
Plymouth, South Devon and East Cornwall Hospital.—Res. Anæsthetist and H.S. to Special Departments. At rate of £100.
Prince of Wales's General Hospital, Tottenham, N.—Sen. and Jun. H.P.'s and H.S.'s. At rate of £120 and £90 respectively.
Queen's Hospital for Children, Hackney-road, E.—Surgeon to Ear, Nose, and Throat Department.
Reading, Royal Berkshire Hospital.—Radiological H.S. and Res. Anæsthetist. At rate of £150.
Royal Eye Hospital, St. George's Circus, Southwark, S.E.—H.S. and Asst. H.S. At rate of £150 and £100 respectively.
Royal Free Hospital, Gray's Inn-road, W.C.—Res. Cas. O. At rate of £150.
Royal National Orthopædic Hospital, 234, Gt. Portland-street, W.—Four Surg. Regs. Each £105. Also Hon. Asst. Surgeon.
Stafford, Staffordshire General Infirmary.—H.P. At rate of £150.
St. Helens County Borough.—Asst. M.O.H. £500.
St. John's Hospital, Lewisham, S.E.—Res. H.S. At rate of £100.
St. Mary's Hospital for Women and Children, Plaistow, E.—Res. and Asst. Res. M.O.'s. At rate of £175 and £120 respectively.
St. Thomas's Hospital.—Jun. Ophth. H.S.
Sheffield Royal Hospital.—Ophth. H.S. Also Anæsthetist. £120 and £80 respectively.
Stoke-on-Trent, North Staffordshire Royal Infirmary.—Asst. H.P. £125.
University College Hospital, Gower-street, W.C.—First Asst. for Children's Dept. £250.
Warwick County Mental Hospital, Hatton.—Jun. Asst. M.O. £350.
West London Hospital, Hammersmith, W.—Hon. Asst. Surg. to Genito-Urinary Dept.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Falmouth (Cornwall) and at New Galloway (Kirkcudbright).

The Secretary of State for the Home Department gives notice of a vacancy for a Medical Referee under the Workmen's Compensation Act for Clackmannan County (Sheriffdom of Stirling, Dumbarton, and Clackmannan). Applications should reach the Private Secretary, Scottish Office, Whitehall, London, not later than Oct. 21st.

Births, Marriages, and Deaths

BIRTHS.

GRAHAM-BONNALIE.—On Sept. 22nd, at Fourth-avenue, Hove, the wife of Dr. F. E. Graham-Bonnalie, of a son.
NORCOTT.—On Sept. 23rd, at St. John's, Birchington, Kent, the wife of Dr. W. Boyle Norcott, of a daughter.
WORTH.—On Sept. 25th, at Welbeck-street, W., the wife of Dr. H. M. Worth, of a daughter.

MARRIAGES.

BOCKETT—KELLEHER.—On Sept. 15th, at St. Boniface's, Mitcham-road, London, Eric John Cuming Bockett, M.B., B.S., Farnborough, Hampshire, to Ellen Florence Kelleher, M.B., D.P.H.
BUCHANAN—FORSTER.—On Sept. 24th, at All Saints', Sedgley, George Burnside Buchanan, M.B., C.M., F.R.F.P.S., of Queen's-gate, London, to Hilda, second daughter of Mr. and Mrs. J. S. Forster, of Overton, Woodsetton, Worcs.
MCMAHON—HANNA.—On Sept. 17th, at Adelaide-road Presbyterian Church, Dublin, Dr. W. J. A. McMahon, B.A., M.B. (T.C.D.), College-street, Armagh, Medical Officer to H.M. Prison, Armagh, to Betty, daughter of the Honble. Mr. Justice Hanna and Mrs. Hanna, Cloneevin, Pembroke-road, Dublin.
RAY—FINDLAY.—On Sept. 26th, at the Manchester Cathedral, by Revd. Geo. Wm. Skeet, B.A., Headmaster of Cathedral Choir School, William Frederick Howson, B.A., B.M., B.Ch. Oxon., M.R.C.P. Lond., son of Mr. and Mrs. J. Howson Ray, Withington, Manchester, to Mina Fraser, younger daughter of Mr. and Mrs. R. S. Findlay, Monifieth, Angus.

DEATHS.

BANGAY.—On Sept. 24th, at Tylehurst Cottage, Chesham, Bucks, Richard Bangay, M.D., M.R.C.S., late of Lyme Regis, in his 99th year.
GRAINGER.—On Sept. 21st, Surgeon-General Thomas Grainger, C.B., late Indian Medical Service, of Redcliffe-square, S.W.
ISAAC.—On Sept. 24th, at Gower-street, W.C., George Washington Isaac, M.B., C.M., aged 74.
LESLIE.—On Sept. 22nd, in a nursing home, R. W. Leslie, M.D., LL.D., of St. Heliers, Strand-town, Belfast.
NICOLL.—On Sept. 23rd, at "Bodicote," Gerrards Cross, Thomas Vere Nicoll, M.R.C.S., L.R.C.P., aged 75.
WEAVER ADAMS.—On Sept. 24th, suddenly, at Llandrindod Wells, Edmund Weaver Adams, F.R.C.S., of Slough.

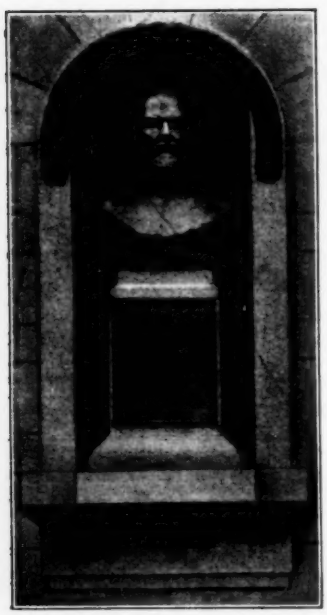
N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages and Deaths.

Summer Time, which commenced in Great Britain, Ireland, the Channel Islands, and the Isle of Man on Sunday, April 19th, will cease on Sunday next, Oct. 4th, at 3 A.M., when the clock will be put back to 2 A.M. The hour 2–3 A.M., Summer time will thus be followed by the hour 2–3 A.M. Greenwich time.

NOTES, COMMENTS, AND ABSTRACTS

MEMORIAL TO SIR JAMES MACKENZIE.

ON Saturday last memorials to Sir James Mackenzie were unveiled in Burnley, where he was in general practice. On the wall of the house where he lived has been placed a plaque, which was unveiled by his brother Lord Amulree. The suggestion of a memorial was originally made by Lord Moynihan, and he it was who presided at the ceremony in Thompson Park, where a bust has been erected within sight of the house. The accompanying illustration shows this bust, under which is written: "Sir James Mackenzie, M.D., LL.D., F.R.S., F.R.C.P., 1853–1925, who achieved fame by his researches in connexion with diseases of the heart and was from 1879 to 1907 a general practitioner in Burnley." Mackenzie, said Lord Moynihan, was perhaps the greatest practitioner this country had ever produced, and the virtue which was his main incentive was compassion.



DIPHTHERIA IN GERMANY.

THE late epidemic of severe diphtheria in Germany was discussed at a recent meeting in Munich.[1] The speakers were careful to point out that the prevalence of malignant attacks was not peculiar to Germany, but had been noted in France, Italy, and North America. The high fatality-rate was shown to be due to the predominance of very severe faucial cases, laryngeal attacks of the disease having considerably diminished in frequency. Although cases had proved fatal in spite of antitoxin treatment within the first 24 hours, Prof. J. Hosler and Dr. H. Schaber vigorously protested against this being regarded as a contra-indication to serum therapy. While not in favour of the enormous doses used in some British and Danish hospitals, they recommended that adequate doses should be given as early as possible by the combined intravenous and intramuscular routes. There was no doubt that in a large number of cases death was due to failure to make a correct diagnosis until it was too late, the throat condition being mistaken for quinsy or retropharyngeal abscess. Valuable time was often lost in waiting for the result of bacteriological examination of the throat swab. In view of the frequent tendency of these malignant cases to occur in groups, such as families or school-classes, Hosler recommended that, in addition to the notification of the disease, the character of the attack should be specified, so that special precaution should be taken, such as passive immunisation in the treatment of contacts. The speakers were unanimous in regarding the malignancy of the attacks as due to the increased toxicity of the diphtheria bacillus alone, and therefore deprecated the association of anti-streptococcal serum with diphtheria antitoxin.

[1] Münch. med. Woch., July 24th, p. 1247 et seq.

A CASE OF SOMNAMBULISM.

"A letter to THE LANCET (*circa* A.D. 1040), by the local practitioner at Dunsinane, describing a strange local case of somnambulism. It should not exceed 150 words."

THIS was the task set for a recent competition by the *Observer*. The winning entries, published in that journal on Sept. 20th, were as follows:—

I.

To the Most Honourable Guild of Leeches, at the Sign of the Lancet in London, these—

I would venture to present to your notice a Strange Case of Somnambulism now under my care.

The patient appears to receive the benefits of sleep while performing the effects of watching, and in this state will hold conferences with visionary persons. Her correspondence also seems to be "on her mind" (as the vulgar have it), and she has a morbid desire for cleanliness.

Having observed these symptoms, I reported them to the patient's husband, who, with true military obtuseness, seemed to think that purgatives were all that were necessary.

Owing to the disturbed state of the country I have doubts whether I shall regain the society of my learned brothers, so I send these that the fruit of my experiences be not lost.

from John the Subtile, Doctor of Physic,
at Dunsinane,
in the Kingdom of Scotland.

II.

SIR,—I shall be glad of any advice your readers may be able to offer for an unusual case of sleep-walking. The patient is a married woman of high social standing. There is a history of her having fainted some eight days ago as the result of a severe shock caused by the receipt of bad news. Since then she has suffered from intermittent somnambulism, complicated by a crime complex, self-accusative in nature, with associated hallucinations of sight and smell. I have consulted Caithness on the "Staggering Gait and Allied Nervous Disorders in Highlanders" without success. Incidentally the case illustrates the inadvisability of such patients being left to the care of servants.—Yours faithfully,

G. P.

III.

Friends of "L. M." applied to us for advice. This patient, whose health appeared to be normal—excepting for a belief in auspices—was reported to be sleep-walking. Two nights we watched without result; on the third the patient emerged from her chamber, carrying a lighted taper. Out of this case arise three points of great interest:—

(*a*) Why, if asleep, did L. M. require a light?
(*b*) It was noted, upon examination, that her eyes were open. Have we not here an important sign of slumbery agitation?
(*c*) There was constant palmar friction, denoting the influence of an infected mind upon the body.

Although the case was beyond our usual practice, we prescribed Rest and Rhubarb. Unfortunately, the patient, though responding well to our treatment, suddenly collapsed, and no further observation could be made.

(Note.—For effects of Rhubarb, see Macbeth's conversation with the Doctor.)

Among the commended are the writer of the letter which states that the patient "had been attending public dinners with her husband, who is not the readiest of speakers, and no doubt she had had a good deal of worry over this"; and the other who concludes with the professional reflection: "I am, however, now wondering whether, as she was haunted by the idea of blood, I ought not, on the principle of *similia similibus curantur*, to have insisted on bleeding her."

AN ADVERTISEMENT.

"C. K." informs us that the following advertisement has lately been conspicuous outside a nurseryman's conservatory on the main road between Havant and Emsworth:—

"*Tomatoes* 6*d*. *a lb*. A local doctor says: 'Tomatoes grown with the aid of sewage cause CANCER.' Our tomatoes are grown in virgin soil with pure water only."